The Builder.

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ON the subject of stained glass, as regards its ancient and modern characteristics, able pens have from time to time contributed observations in these columns; and in other quarters such views of the subject have been discussed almost to exhaustion. The battle of styles, too, has been fought with warmth and energy, leaving the issue in a truce, unless, indeed, the reasoning of Mr. Powell, of Birmingham, as lately printed in these pages, turn the scale. We are disposed to believe that, in the zealous inquiries into the archæology of the subject, and in the earnest championship of its principles, this way or that, the incomparably most vital point has been utterly lost sight of, namely, the causes by which have been brought about the almost entire absence of health in the present condition of the art, and the urgent necessity and means for its reformation.

It has been declared that our artists on glass have as yet exhibited but unfavourably in contrast with the old masters, to whom the world is indebted for the painted glories of Chartres, Canterbury, and Fairford; moreover, they have been said to compare unsuccessfully with the Germans of the present day.

Notwithstanding the scenic trickery of the German artists, and their efforts to neutralise the finest,—*i.e.* the most natural elements of stained glass in its material and individuality as an art,—the new windows for Glasgow Cathedral are to be commissioned, not of English artists, but of those of the Munich school, by whom were lately erected the academic though vapid transparencies of Peter-house College Chapel, Cambridge.

Despite the honest opposition which has been evinced by those of deeper knowledge of the subject than was exhibited in the dictum of the Glasgow authorities, it cannot be denied that there now exists such wide-spread disease in the English system of stained-glass work, that the conclusions referred to may possibly be explained on the forlorn principle that the most mistaken application of art is preferable to the ignorant burlesques upon it which mark eight out of every ten of the windows erected in the present day. In so far, this charge and practical demonstration against our own artists approach the point upon which the attention should be drawn of those who still evince some solicitude for a true art, sickening, and unable to conceal its plague-spots, yet capable of cure; at the hands too of those by whom it has been so inconsistently spurned.

The great question which should present itself to those who would pass judgment in the case, is involved in the consideration of how far *artists*, in the true sense of the term, can be said to have had, or been encouraged to have, anything to do with the subject at all; and thus, how fair it may be to arraign for sentence those who can so obviously prove an *alibi*.

The practice of stained-glass work, in its natural condition, is either an *art* (as we conceive it to be, in the strictest sense), or it is a mere matter of manufacture. That it is the former may be asserted from the fact, that there is no aptitude that an artist can possess by nature or education, for colour, poetry, or composition, no power of expression, draughtsmanship, or invention, that may not in glass be legitimately wedded to its materials, and the true principles of its requirements in design. If, then, these premises are correct, we have to point out one of the strangest anomalies of the day.

With few exceptions, modern windows, purporting to be of high character, emanate from establishments in the names of men whose art-skill does not reach even to a miscroscopic proportion, and whose existence in the assumed authorship of even the degree of art produced in their pay, depends wholly upon their scrupulous avoidance of giving to their patrons the most trifling evidence of their own handiwork.

Thus it is, and has long been. By a general absence of due discrimination and selection on the part of those who dispense the patronage of the subject, men of purely trade instincts and commercial adventure have started up, craving the "favour of orders," succeeding abundantly in their speculation, and finding upon the fair field in which such art as Durer's was once fostered, a fruitful arena for per-centage calculations and business enterprise. And this has existed, nay, flourished, in the name of art!

> "Can merchant-authors—they who range
> Between Parnassus and the 'Change,
> Sole denizens of neither—
> Who seek to play a double game,
> To grub for gold and fly at fame,
> In truth, be blessed with either?"

In trade matters, the position of the vendor of stained-glass work, as a producer, may, of course, be paralleled *ad infinitum*; but, let it be remembered, the most powerful element of commerce may be the deadliest poison to art. Were the great works bequeathed to us by former ages created under this "cold shade" of Mammon? Will an artist, whose works are worth having, and who (like his art-brother that controls the stone vault, or imparts breath to the marble block) finds in reputation the best part of his reward, give warmly the full flow of his invention and aspiration, at so much per diem?

Can such a one sink his name and lovingly pursue his art under the paymaster whose interest in him is represented by pounds, shillings, and pence? Can, indeed, anonymous art long remain art at all?

The only one who can, in fairness to a patron, consistently hold himself responsible for any art (but especially for that all-important phase of it which embraces the illustration of the sacred books), is the artist himself.

We do not criticise a poem in favour or disfavour of the publisher, nor are poetic conceptions in architecture or sculpture attributed to the authorship of the mason or of the quarry masters of Carrara. In whose name, then, may most of our modern windows, good or bad, be fairly reviewed?

As matters of detail, there are other pernicious influences acting with deadening effect upon glass-painting, to which allusion may be made, namely, those which have resulted from the importation of German prints after Overbeck, Schnorr, Fürich, and others of the school. These engravings and lithographs, together with those after Rubens and even West, have formed the stock-in-trade of many of those practitioners who enjoy, under the present state of things, a positive reputation as "artists on glass." Sometimes, by a not unusual effrontery, a whole composition derived from such sources, and cruelly mangled in the ignorant rendering, may be seen as intact, as the circumstances of the case would permit; at others, an attempt to cloak the clumsy theft by a torturing of figures by, say Fürich, into part compositions of Overbeck, &c. &c., may be easily detected; and then, worse than all, will come a few "make up" figures and accessories by the artist (?) himself. Thus has modern glass, in one of its most abject forms, been bolstered up and encouraged.

This is no exaggerated statement of the condition of stained-glass work in this nineteenth century of ours; but the evil, deep though it be, is not past cure. Let those to whom art is something, and who at once regret and deride its position in relation to glass, who by their purse and influence would encourage it to better things, not despair of its easy emancipation. Let them probe the matter deeper than they have yet done, and seek the artist on glass as they would his brethren of painting, architecture, or sculpture. Let them, in simple justice to those who devote to the art their best years and warmest studies, thus open the doors of truth to true authorship. Let all evidence of the miserable print plagiarism and trade system be sought out, as a wholesome preliminary in determining the choice of him who shall commit to future centuries a thing of beauty or a chromatic eyesore.

Pursuing such means glass-painting will not long remain what it now is—a reproach to English art. Those few true men who are steadfastly devoted to it, will, under fairer encouragement, be joined in art-brotherhood by others who are now scared from the pursuit; and the present *trade* of glass-painting will give due place to the banished *art*, which has so long yearned for the day upon which the veil shall fall from the eyes of those who, with good intent, have sought it in darkness and in error.

POLYCHROMATIC DECORATION.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

ON Monday evening, 14th December, the ordinary general meeting was held at the Rooms, in Grosvenor-street, Mr. J. B. Bunning, V.P. in the chair. Mr. R. Kerr and Mr. Norton, attending for the first time, were admitted as fellows, and Mr. C. Arding, as associate.

Mr. Digby Wyatt, hon. sec. announced a long list of donations, including from the Minister of State, Paris, "Archives de la Commission des Monuments Historiques, Livraisons 19 et 24," Paris, 1856; "Observations on Metallic Art," by Mr. Wyatt, extracted from the Art Treasures of the United Kingdom, edited by Mr. J. B. Waring. 4to. London, 1857; from the author, "L'Art moderne, par Theophile Gautier;" from the author, "Nineveh and its Palaces," by Joseph Bonomi.

Professor Donaldson said, amongst not the least important presentations of the evening, was the donation by their president, of two noble medals. The first was a medal struck by the corporation of the City of London, on the occasion of the visit of the Emperor of the French. It was a medal of large size, and did honour to the City. The other medal was struck to commemorate the visit of the King of Sardinia, in 1855. They gave the portraits of the imperial personages, had beautiful reverses, and were executed by Mr. Benjamin Wyon. It was a gratifying thing to the Institute, to find that their chairman, on that occasion, had urged the City of London to take the steps they had taken so recently, in promotion of the fine arts. It was he who had induced the corporation to cause a number of statues to be executed, to fill the niches of the Egyptian-hall, at the Mansion-house, where 6,000*l.* had been laid out, besides the sum that had been expended for the Wellington monument, in Guildhall. He had promoted the striking of these medals, and as the representative of art in the city of London, they were indebted to him for having excited its citizens in the laudable promotion of the fine arts of this country.

The Chairman explained that, at his suggestion, it was determined to strike these medals for the encouragement of art, in the promotion of which it was gratifying to find that the corporation of the city of London had never been backward. He trusted that as long as it existed it would continue to do so, and as long as he remained their servant he would never lose an opportunity of assisting.

Professor Donaldson.—Their chairman had said as long as he was "a servant" of the corporation. Now, if there were a man who was less a servant, but rather a more worthy officer of the corporation, it was Mr. Bunning. His independence of character peculiarly qualified him for the office, and rendered him superior to all meaner considerations in the exercise of a sterling, honest, English independence of spirit. It was very rare that medals were struck, and rarer still to

find the opportunity of doing so seized by Government; and when it happened to be otherwise, the execution of them was confined to one family,—that of Wyon, undoubtedly a man of great talent and worth: but was it not a shame that, in the production of these works of art, only one family could be found capable of executing them? The Art-union of London had been anxious every year to strike a medal in commemoration of the history of the fine arts; one year striking the portrait of a painter, another of a sculptor, and another of an architect. But the great difficulty was to find artists to produce these medals. It was, he thought, disgraceful to our Government that they so rarely seized the opportunity of striking medals of the size of those before them, and he could not help suggesting that the approaching auspicious union of the Princess Royal would be a fit and fine subject for such a commemoration.

Mr. Wyatt announced that the Britton memorial had been completed, and was erected in its place in Salisbury cathedral.

Mr. T. H. Lewis, fellow, then read "A Brief Account of an Experiment made upon Concrete, expressly for the Committee of the Architectural Publication Society, and of some others," which we give in full on another page. After a short discussion, and a vote of thanks for the communication,

Mr. George Aitchison, jun. read a paper, polychromatically illustrated, "On Colour as applied to Architecture," to which we shall return. At the close of it,

Mr. Burges was afraid he could add very little to what Mr. Aitchison had told them. His (Mr. B's.) studies had been confined to Mediæval and Pompeian buildings. When at Pompeii, he thought the style of buildings exceedingly agreeable, and rather forcible. The natives of hot climates were fond of rich colours, because their windows were so constructed that the light penetrated very little. Mr. Aitchison classed the Mediæval system under the white, the blue, and the gold ground; but they would likewise bear being classed under the finished and the unfinished. When a cathedral was built they put stained glass in the windows, and obtained colours by that means. There was so little wall space that there was no room for pictures. The consequence of this was, they left it white, each of the piers being exceedingly small, and then they continued the colours of the windows by picking out the hollows of the principal mouldings with red, the only parts strongly decorated being the bosses and the mouldings of the ribs, for about 1 foot from them. This system was found at Chartres, Beauvais, and Ely. Occasionally, but not very often, the capitals were coloured and gilt, as at Cologne, where, however, they adopted strong colouring, as at the Ste. Chapelle, and coloured the space between the windows: the effect was exceedingly bad. As regarded coloured decorations, however, he thought the Ste. Chapelle was something horrible, and that it would not bear comparison with the Lower Chapel at Assisi. The western and southern systems could not go together. If you wanted colouring in a building, you must give up moulding, or *vice versâ*: and for his own part, he would always give up the mouldings. In the case of the chapter-houses at Salisbury and Ely they went further than in the cathedrals. At Salisbury they gave very little colour in the glass. It was nearly all grisaille. They then coloured the hollows of the mouldings, richly decorated the bosses and the space immediately surrounding them on the vaulting, the rest of the vaulting was covered with red lines in imitation of stone-joints, a very common system of decoration in the lower coloured buildings of the Middle Ages. On one occasion he was in the little church of Mollinet, near Rouen, and found that it was almost in the same state it was in during the Middle Ages, and nearly every square inch of it was covered with some decorative pattern. In the case of Salisbury Chapter-House, the colour was gradually brought down from the bosses by means of a little white, red, or yellow on the ribs, until it reached the windows. These had the circles in the tracery, and a band of shields running along, horizontally, through all the lights in full lined rich-coloured glass. The borders continue this colour to the bottom of the windows, where the arcade that runs round the whole of the building was most richly and fully decorated. It was the same in the Lady Chapel at Ely. They brought the colour carefully down; the windows were all of stained glass, with a far greater proportion of white and yellow in them than at the Sainte Chapelle: the effect of which latter he could not help thinking was unmitigatedly bad. In Italy, if they wanted colour in a church, they used Mr. Aitchison's blue ground, and separated the picture by borders with a thin white line on either side of them, for it was these white lines, and not the borders, that made the real line of separation. On the other hand, they took care not to deaden the effect by mixing white with it. It was pure good blue, and upon it they painted, in tender colours, such as light pink and light red, and white, shaded with different tones of blue and red; and sometimes they even used a scarlet figure to vary the effect. At other times they used a beautiful light purple, which was so great a favourite with the artists of the Middle Ages; and all these colours were to be seen in perfection in Van Eyck's picture of the Adoration of the Lamb. Then when they used gold grounds, as at Palermo, they still used light colours, but separated by means of darker ones, only in much smaller proportions. After all, the effect of a building would depend a great deal upon light. The Upper Chapel at Assisi looked nearly as bad as the Ste. Chapelle, because there was too much light in it; on the contrary, one of the reasons for the Lower Chapel looking so beautiful was, that the light only penetrated into it through the windows of the side chapels. As to the future of architecture, in regard to decoration of buildings, we must have figures and employ the painter, for all decorations without figures always appeared to him to be exceedingly tame. We must get the painter to treat the building as an architect would, and put an architect over him to look after him; but it would be better still, although we might have to wait for two or three generations, if architects turned painters themselves. Let them erect the building, and then decorate and paint it, and so leave a thoroughly perfect good work behind them.

Mr. Penrose questioned whether, in the present state of polychromatic knowledge, it was possible to lay down many dogmatic laws. A few, perhaps, might be pointed out, such as the necessity of placing delicate white or thin black lines between certain colours, the immediate opposition of some colours producing discord, if it can be pointed out and asserted; but it was dangerous, he thought, in their present state of polychromatic knowledge to assert anything very strongly on the subject. Many more experiments, and much more research, were necessary, and he believed that many persons were deterred from approaching the subject by reason of its very great difficulty. The study of flowers, of the colours of skies and landscapes, of butterflies and birds, would do more for them than the study of scientific books. He believed that the great success of the untutored nations in colour rather surprised us, and was referable to the fact that they looked to Nature in the first instance as their guide; but commentaries on the higher applied laws of specimens in colour drawn from the great buildings of antiquity, were of the utmost importance. From thinking on the subject generally, he had been led to the conclusion, that on the particular purpose of the building depended very much the key in which it should be coloured. In some cases a white ground, or nearly white, was to be selected as the best: in others, where a moderate light was admitted, the very strong colours, the deep blues and deep reds were used, and he believed that in all cases the deeper colours were better for adoption, always excepting mosaic, which, from the brilliancy of its gold ground, and the peculiarity of its reflection, enabled it to bear much greater varieties of light; but, at the same time, it would not bear a very strong light. Hence, the apse of the Triclinium of Leo certainly had an unsatisfactory effect.

Mr. Lockyer could imagine nothing finer than the large mosaics at Orvieta and Sienna. At sunset they displayed a perfect floating sea of gold and colour, which told out in the most beautiful manner.

Mr. Baker would not discuss the question as to whether the white line or the black line affected the appearance of colouring, but it was of considerable importance to insure that the various colours should be in light and shade, as it were, duly proportioned, as in a picture; and, as in the specimens before them, effect depended on brilliancy of contrast. Were any one to paint on a piece of paper a series of colours of very nearly even depth, it would surprise them to see how difficult it was to distinguish one colour from another of nearly the same depth of colour. One would be bright, and another dark, and the contrast was most beautiful. The specimens of coloured mosaic showed a beautiful effect when the dark blue background was brought out into good outline. He was sorry to hear Mr. Aitchison's general condemnation of the Pompeian painting; for although the contrast to the general outline was occasionally disagreeable, the tones of colour were very beautiful, and gave us delightful hints for its adoption in our own climate.

Mr. Fowler alluded to the case of a chapel which, some fifty years ago, on being deprived of its coatings of whitewash, disclosed rich specimens of polychromatic decoration of the time of Henry VII. At the period in question it was thought nothing of, but then there were no architectural or archæological societies, ever ready to appreciate such discoveries. He had always felt that the polychromatic branch of their art demanded more study than it had hitherto received, and he was glad to see it taken up by the rising generation, and followed out with so much research, as well as being so ably illustrated that evening. Whatever might be said about the Sainte Chapelle, he thought they must give the French credit for having, at immense labour and expense, worked out a very striking experiment. For his own part, he thought the experiment unsuccessful, but still it was valuable as a fact to refer to. Some people might think it was over-done or under-done, but there it was as a matter for speculation. If he might express his own opinion, he should say it was exceedingly over-done; and it was unfortunate in the effect where decoration was spread over the integral parts of a structure which ought not to be interfered with. Decoration came in, and told well subsidiarily, but the structural parts of a building should stand out in their integrity. It was a mistake to imagine that the column should be diapered and scrolled over, or covered with what he would term impertinent decorations. In the case of the Monreale at Palermo, with which they had become familiar by means of the productions of their late worthy member, Herr Zanth, it appeared to him to make one of the most charming instances of polychromatic decoration, and, as he conceived, one of the most successful and genuine. But he could not form a decided opinion, not having seen the original, but he mentioned it as one of the successful instances of art-colouring when it was better understood and more extensively used than it had been since.

Mr. Lockyer protested against the condemnation that had been indulged in both as regarded the Pompeian and Giulio Romano decorations. Any one who had seen the Villa Papa, the Villa Madama, and the works at Mantua of Giulio Romano, must feel that he was a thorough master of his subject, knew what he was about, and used no colour or form injudiciously. He (Mr. L.) might be impure, perhaps, in his taste, but in upholding his works, it was from a conviction that there were few works in Italy that struck him so much as the performances of that artist, both as to design and arrangement of colour. Mr. Aitchison seemed to find fault with the deep masses of red, but in that climate you rather required masses of colour. They were very well lighted by the subjects painted upon them, but certainly the brilliant sunlight and atmosphere of Italy seemed to require those masses of colour which are dispensed with in England. With regard to mosaic decoration, Mr. Aitchison mentioned the better effect of gold when produced on a green ground. Now it struck him that in the case of most of the mosaics of Italy the gold was on a reddish ground, and very few on green. In the San Lorenzo it was on green, but there the effect was poor.

Mr. Wyatt.—The earliest mosaics in the Santa Sophia are on deep white; in later ones they became red.

Mr. Kerr was quite of opinion that polychromatism was one of the principles of their art that ought not to be passed unnoticed. He understood Mr. Aitchison to say that the art of colour was a matter of instinct and not of rule; that it was not a matter of science but of intuitive and instinctive knowledge, under the correction of an experienced eye. Now, nothing, in his opinion, could be a greater mistake in the abstract. If he were called upon to define colour in relation to architecture, he should say it was the music of their art. Nothing could be more correctly weighed, estimated, or definitively reduced into system. Not that he would say that it had been so weighed and estimated, and its elements accurately reduced into system; but the work of Chevreul on the subject was exceedingly mathematical in all its processes for the determination of principles on which every one might very safely rely. The interior decoration of a building in modern times with colour must be a peculiarly interesting subject of inquiry to the architect. When he spoke of colour as being the music of their art, he was not speaking altogether figuratively, for he fancied that the interior of a building might be decorated in any one of many ways, just in the same manner as a piece of music might be set to any one or many expressions or sentiments. When we wished to decorate the interior of a structure in a bold and striking manner, or if, on the other hand, we wished to carry out the work in a smooth and graceful manner, we adopted the desired material and design in order to produce the wished-for effect on the mind of the beholder. In the classical times of antiquity he was inclined to think—notwithstanding all that had been said, and perhaps proved, with regard to chromatic decorative building—that it was not carried on to a very great extent. He, for one, as an admirer of Greek architecture, should be sorry to admit that they did colour the exterior of their buildings. The operation of the mind at that time and in that age was more stern and severe; but when you came to the Middle Ages, you found the mind losing its severity—losing that sternness, and more involved in complication of lighter details; and then in after-time, and by gradual progression, the use of colour became more applicable to the mind and the purposes of art, and in the Mediæval and Renaissance works,

which were governed by principles almost entirely by Mediæval examples, we found that colour began to be adopted and used, not only with profusion, but with something more than gusto—with success, with intuitive success. Now, the colouring that was to be found in Mediæval buildings, successful as it was, was not successful by accident, or by the application of rules, but the existence of rules may be easily discovered. Chevreul discovered a great many, and laid down remarks on position. If Mr. Aitchison would only collect the specimens that were hanging about, and assort them in various classes, he would find that certain principles governed one class, and certain principles another, which must inevitably be, and without which colour decoration could not be successfully employed. It was different with form, the other great principle and department of their art. They could not weigh form, but they could, as it were, weigh the music and poetry of colour, and so lay down fixed principles of action. Indeed, there was no subject in the present day more deserving the attention of scientific men in relation to architecture than colour.

Professor Donaldson was of opinion that the great principle that should guide an architect in the decoration of his building, should be its character and its object. When he had gone into a building decorated to any extent, he really ofttimes could not appreciate what the intention of the architect had been. It appeared to him that primarily in a building, architecture should take the leading position,—that is, the place of prominence and honour, and that all decorations should be subordinate to its members, in order to fill up the plain spaces, and give effect, by decorative contrast, to the severer features of architecture. Mr. Burges had very well said that he perceived very frequently in the Mediæval buildings, that the colour was in the hollows, which threw out in greater relief the small shafts of the piers. There he (the professor) thought that colour was very admirably introduced. But when they found colour usurping the proper place of architecture, and architecture, instead of itself being represented in natural materials, relieved, as it were, here and there by accidental portions of colours; when he saw the white surfaces of buildings themselves coloured by artificial pigments,—colour usurping a place it ought not to possess, and architecture put in a secondary position,—he could not help thinking that it was degrading to art. If architecture was to be decorated, it should be by varieties of material, that is, by different tones of coloured marbles and stone, of which the shafts and friezes should be constructed, and not to admit of artificial decoration. When they went into the Temple of Jupiter, at Pompeii, and noticed the podium, with its horizontal cornice, and then the courses of stone above, which were all of different colours, it seemed absurd that colour should be made to represent material, and you did not see anything to justify it. But here the colour introduced was *bonâ fide*, and part of the material. It represented architecture, whereas in other cases it did not, and only represented subordinate ornamental decoration; and so it should be whether it be simple diaper, or other colours, or other ornamental forms, like those given in the illustrations. When they talked of the Sainte Chapelle, what could be the purpose of the architect in the decoration of the building (he had not recently seen it himself), in covering with an artificial coating the whole of the beautiful architecture there? About forty years ago, he saw a representation of the decorations of St. Stephen's Chapel, Westminster. It was altogether covered with colour, which had a very gorgeous and magnificent appearance, but to his (Professor Donaldson's) mind, the proper, legitimate, and sober effect of the architecture was lost, and it seemed to be more an adaptation of mere tapestry hanging than a proper matter of architectural effect. These, he thought, were the principles on which buildings should be decorated, *i.e.* what should be the proper purpose and appropriate interest of the architect. He differed with Mr. Aitchison in his condemnation of Pompeii, but it should be remembered that where these decorations were placed, rather in the shade than exposed to the sun, nothing was more proper than the introduction of brilliant tints. Mr. Aitchison stated that he noticed there were little columns and diminutive entablatures, and capricious decorations introduced, for which he could see no use; but it should be remembered that these objects doubtless represented a class of architecture of which no remains have survived at the present time, and that the domestic details of their buildings were of a small and delicate kind; and if we recollected what we can do in iron and wood, though at that time they appeared to be in bronze, the representations would appear to be harmonious. He (Professor Donaldson) was not pleased with what he saw in the baths of Titus at Rome, but he was delighted when he studied the villas in the neighbourhood; some of the paintings were on a white ground, and told out with very beautiful effect; while others were on a dark ground, and brought out the colours even more brilliantly than those on a peacock's tail. Among Mr. Aitchison's drawings, the black spots were in very small masses, else they overpowered; and they were used subordinately, so as not to produce a heavy effect. With respect to the white lines, the Egyptians understood the value of them. We should find this in the Egyptian paintings in the British Museum. We should there see that a white line separated the greens, the blues, the reds, and yellows, and gave to each tone its true and proper quality. When he thought of the Palazzo T. he could not go the whole way with Giulio Romano. The decoration appeared to him in many parts to be puerile, and the result of caprice rather than of genius. There was so much extravagance of contrast and proportion, that he left the Palazzo with disappointment. He thought that Baldassari Peruzzi da Sienna had designed great works in this style, as well as Giulio Romano, who had a heavy hand, and was frequently capricious; and most beautiful works were also designed at the Villa Caprarola by Vignola, who perfectly understood these decorations. Professor Donaldson concluded by moving a cordial vote of thanks to Mr. Aitchison for his paper.

Mr. Aitchison briefly replied, with much spirit and effect, to the observations that had been made; and the meeting adjourned for the holidays.

EXPERIMENTS ON CONCRETE.

THE experiments here described were chiefly made with a view of verifying some facts mentioned in the description of "Concrete," in the Dictionary of the Architectural Publication Society. But I have incorporated with these the results of some other experiments previously made by me. The general idea with respect to this material is,—1st, that there is a sensible loss in bulk of the ballast, independently of that of the lime; and, 2nd, that the materials, on being mixed together, expand considerably. So much is this idea prevalent, that a respectable builder,—one, I am sure, quite above stating anything that he did not believe to be true,—required, in calculating the price of the concrete, that I should allow him one-seventh more ballast than the concrete cubed to, he depending on the published statements of the loss of ballast being thus great. It was this demand that first led me to experiment. The following trials were all made in the same manner, and, with one exception, I was present at the whole process from beginning to end. Several of the committee of the Architectural Publication Society also attended at the trials. A wooden box was made, holding exactly one cubic yard. This was filled with a fair sample of the ordinary Thames ballast, and such as is used for concrete in London. To this was added ground Medway grey stone lime, in the proportion of one of lime to six of ballast. The whole was there turned out and mixed together in the ordinary way, the cube yard taking about forty gallons of water. The whole bulk would thus stand as follows:—

Ballast.....	27	feet cubic
Lime..... 4½ }	10½	do.
Water c. 6 }		
Total.....	37½	do.

The concrete, thus mixed, was thrown into the box from the level of the ground, so that the lower part would have a fall of about 4 feet, and the upper part of 1 foot. The experiment was also made of throwing it in from a platform, 10 feet above the ground. In each case the result was the same, viz. the whole mass, made into concrete, occupied precisely the same space as the dry ballast, viz. one cubic yard, all the bulk of the lime and water, being about two-fifths of that of the ballast, being lost, but none of the ballast itself. The surface was carefully levelled, and thin boards tacked over, so as to ascertain if there were any expansion in the setting, but none could be perceived.

The weight of the mass was 27 cwt. I then had some more ballast mixed with a similar proportion of *un*ground lime, broken into small pieces, and wetted for a quarter of an hour. It was in that time pretty well slaked, but there must have been a good deal in the centre of the lumps not so. We know, from our every-day experience of the blistering of plastering in internal work, that a very long time is required to slack lime thoroughly, and I thought that, as this operation was going on to some extent after the concrete had been mixed and put into the box, a sensible expansion would take place.

This, however, certainly did not, for not the slightest increase of bulk was perceptible. I had the first tried portion (mixed with ground lime) broken up about a week after it was made. The parts immediately below the surface, and all underneath them, had not set, but the whole formed a compact mass without any vacuities whatever, the upper parts seeming to be as solid as the lower, although the difference in the fall was 3 feet.

A portion of it I put into water. I examined it in a fortnight, but it had not then set. I am sorry to say that I omitted to look at it again for a considerable time, so that I cannot speak as to the exact time of its setting; but when I took it out of the water, seven months after, it was quite hard. I mention this, in order to show that the concrete was at least a good average sample.

In order to try the matter more in detail, I had a box filled with very clean sand, such as is used by masons. The box was then well shaken, and the sand settled down so as to lose about one-fifth of its bulk. The box was then filled up, so that, in fact, it was made to hold about one-fifth more than its ordinary quantity of sand.

This was turned out, and well mixed with water. After this it filled the box, but on being shaken subsided down to the same level as before, thus losing, in addition to the bulk of water, one-fifth of its own bulk as before.

This wet sand was then mixed with one-third of its bulk of ground lime, and made into mortar, which just filled the box. The surface was levelled, and carefully tested during the setting, but neither expansion nor contraction could be perceived.

Another experiment was then tried, at the suggestion of Mr. Wyatt Papworth. A box was filled with coarse ballast, and one-seventh of unground lime added to it, the lime being broken up into smaller pieces, but not very carefully, and then mixed with the ballast. Water was poured on, and the mass thrown into the box when only partially slacked, the object being to see the effect of this process, which might be considered a tolerably fair example of what the men might do if they had a certain portion of work to do with unground lime, without proper inspection, and careful only to get the whole done as soon as possible. The result was a slight but a decided expansion.

I then had another box filled with ballast, which was mixed up dry, with rather more than one-sixth of its bulk of ground lime. On being put into the box again, the two together occupied a rather larger space than the ballast did separately. The mass was then levelled, and about as much water poured over as would be used ordinarily. The result was, as before, a decided expansion.

One other experiment I should be glad to mention, as it is a curious one, and bears upon a part of the subject very little, I think, understood, viz. the setting or hardening of the concrete or mortar.

A friend of mine, who is a first-rate chemist, suggested to me some time since that the addition of a carbonate to the mass would cause it to set more quickly, and for this obvious reason; that as the lime is supposed to be hardened by the absorption of carbonic acid, any substance in combination with that acid would offer to the lime its hardening medium in greater quantities than could be procured from the air in the same time. He further stated, though he could not procure me the details, that the experiment had been tried, on a somewhat large scale, with carbonate of soda mixed with concrete used under water, and with complete success.

I, therefore, had some more concrete made, and mixed with carbonate of soda as directed. It was put into water, and, in sixteen days, was finally set. Similar concrete, but without the soda, was not set at that time. I tried some mortar made in the ordinary way, and some also mixed with carbonate of soda, but in a larger proportion than with the concrete. This experiment was, however, not encouraging, as the mortar on setting crumbled to pieces. I think this artificial hardening might, as the process is a cheap one, be experimented on further with advantage.

T. HAYTER LEWIS.

THE POINTED PENDENTIVE DOME AS A RIBBED VAULT.

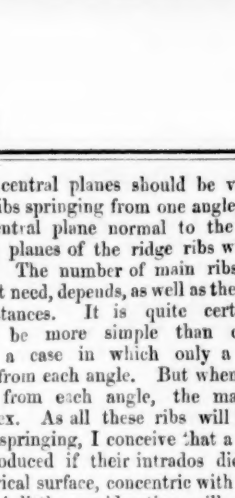
IN making the remarks to be found at page 465 of this volume, on the pointed pendentive dome, I merely considered it as a simple shell; but with this vault, as with others, the greatest economy of material and the greatest structural efficiency are to be attained by the application of a system of framework or ribbing.

In applying ribs to this vault, we shall find them to be of several different kinds;—first, main ribs, being the arches in which the chief strength of the vault is placed. These spring from the angles of the plan, and spread over the surface of the vault. Secondly, ridge ribs, which spring from the apices of the enclosing, otherwise termed forming or wall-arches, and meet in the central boss of the vault. Thirdly, we should name the horizontal ribs which serve to stiffen the main ribs, struts: these, of course, not being absolutely necessary, or not so in all cases.

For the main ribs to be in equilibrium it is neces-

sary their central planes should be vertical; thus, of all the ribs springing from one angle, only one *can* have its central plane normal to the vault surface. The central planes of the ridge ribs will, of course, be vertical. The number of main ribs one of these vaults might need, depends, as well as their dimensions, on circumstances. It is quite certain that few things can be more simple than one of these domes, in a case in which only a single main rib springs from each angle. But when several main ribs spring from each angle, the matter becomes more complex. As all these ribs will be close together at the springing, I conceive that a very ill effect would be produced if their intrados did not coincide with a spherical surface, concentric with the surface of the vault. A little consideration will show that the main ribs would in this case be somewhat greater in depth than the central or diagonal main ribs of the vault (those which alone are normal to the vault surface). The main rib nearest to the central rib would be a little deeper, the one beyond that somewhat deeper than that, and so on: this difference of dimensions, however, is a mere nothing. But the result would be not only the greater grace from the preservation of the geometrical figure, but that the joints or meetings of the ridge rib and the main ribs would mitre fairly, as well as the joints of the latter with the struts. I should think the mitred joint more suitable to this vault than the boss-concealed junction: either mode is applicable, however. By these arrangements the arched ribs transmit the thrust of the vault only to the angles of the plan. But it may be seen that the ridge ribs descending upon the apices of the inclosing arches, exert outward pressures on these points. The way of resisting this thrust which has suggested itself to me as the most simple, is that of extending the wall arch into the vault, and giving it sufficient solidity to have an inclination to fall inwards, the ridge rib pressing outwards, and thus at the same time that its own outward tendency is restrained, restraining the inward tendency of the overhanging wall arch. In this manner these forces tend to the strengthening of the whole construction. This member, which might be named the hanging wall arch, is not needed where another ridge rib counteracts the thrust of the first, as in the length of a vaulted avenue.

It may be remarked, that it is by no means difficult to make many modifications in this vault. Various circumstances would suggest these, such as the cases of the dome having to support a superincumbent vault or lantern, or in its being finished with an open eye (which, perhaps, constructional reasons would dictate to be of a starlike form), &c. I give a modification of this vault, which might not be unsuitable at times.



A A. Main ribs. B B. Ridge ribs.
C C. Hanging wall arches.

The plans to which it is applicable are oblongs' hexagons, octagons, decagons, &c. which are not perfectly regular figures, but which have every alternate side longer than the others; so that there would be two dimensions of sides, an equal number of each dimension. The longer sides being spanned by semicircles, pointed arches would span the shorter ones. These vaults would consist of *half* the number of sections of which there are sides on plan, *i.e.* two to an oblong, three to a hexagon, &c. of a sphere, the radius of which is the same with that of a circle which would circumscribe the *regular* oblong, hexagon, &c. (as the case might be) having its sides equal to the longer sides of the plan. In the case of an oblong, the radius is $s\sqrt{2}$; s equalling the longer sides on plan. Any plan that can be covered by this vault may be likewise covered by the ordinary pointed pendentive.

As compared with other vaults, the pointed pendentive dome possesses, like the fan groin, the great practical merit of all its ribs being portions of circular curves, and in common with fan and other groins, that the whole thrust is concentrated at the angles. Over the fan groin it has the advantage of having all its enclosing arches, as well as its diagonals, of the same figure, whether equilateral, higher, or lower. It has the advantage of affording greater spaciousness of effect than any groining can have. It has the great advantage, *above* other pendentives, of its loftiness. Over the various groinings it has the advantage of possessing a smaller extent of surface than any of these, if pointed in section, as well as the advantage of the spandrils requiring much less loading, because containing much less cubic space. The less extent of vault surface of course requires fewer ribs than that of groins: one result of these circumstances is the smaller weight of this vault, compared with others.

I almost think that a sufficiently strong case has been made to induce some architect, of geometric attainments, to take this wandering vault into his protection,—this offspring, shall I say, of the systems of groining and of doming, partaking in so large a degree of the nature, as well as assuming the decoration of both,—the paternal rib, ramifying in strength over the surface, and the maternal grace of panelling and interlacing works, spreading in elegance over the space between the ribs, besides its own more particular adornment, which might be richly carved with foliage, or with geometrical patterns—the hanging wall arch. I wish, then, *so* some one would, and work this almost or altogether untried form into something which, while altogether our own, might be worthy of British architecture in the nineteenth century.

S. C. R.

EDUCATION AND PROFESSIONAL LIVES OF THE EARLY ITALIAN ARCHITECTS, PAINTERS, AND SCULPTORS:

AS CONTRASTED WITH THE EDUCATION AND PRACTICE OF MODERN TIMES.*

Teaching and illustrating by biography has always been a favourite means of inculcating and enforcing good precepts, and we have the highest authority for its use in far more important subjects than that which I am about to bring before your notice; and it seems to me that, in treating of particular professions and occupations, the consideration of the circumstances, educational helps, obstacles, and early influences in childhood, friendships, antagonisms, affections, and patronage of manhood, and the honours, the reputation, the hardly-earned independence, or the unfortunate dependence, the results of the training of the child, and the habits, whether good or bad, of youth, to be traced in age, and the final tribute to a life well spent by their survivors, with the consideration of modes of practice of their particular branch of their profession, brought about by their particular education and influences, is especially valuable to the living and working students of those particular professions who have present with them many of the great achievements wrought amid encouragement and discouragement, sickness, pain, and anxiety, in spite of obstacles, misapprehension, and even ridicule, by their predecessors. Therefore, at the present time, when, though the profession abounds in able men, greatly skilled and highly educated, especially in certain attainments, yet considering the many advantages possessed by us, the number of works of every preceding age open to us, and brought home to us by the great modern inventions of printing, and every form of illustrative engraving and photography, the perfection of manufacture in almost all branches, and the great facility of conveyance for materials, and also for the concentration of all required talent to any point of our land required, the art produced is not of that standard of originality and beauty attained by the men of old, and certainly not of that proportionate standard that might be expected from our marvellous advantages,—I trust it will not be deemed lost time to endeavour to consider what important differences exist between the education, professional lives, and practice of those who, in days past, produced works which we in the present time look upon as worthy of admiration and imitation and make long pilgrimages to foreign lands to see, and those of modern times; and whether the same order of men practised architecture in those days as at present.

With this view I shall give some brief sketches of those particular points, in the lives of the early Italian artists, as related by Vasari, that I consider elucidate the subject in question. I choose the early Italian, because, thanks to Vasari, we are better acquainted with the lives of those who have produced celebrated works, and because their mode of practice is that which I particularly wish to bring under your consideration, my main point being to show that in those days men were selected to give designs for buildings, in consequence of their artistic acquirements, they often being men that up to that period had not turned their attention particularly to architecture, but were considered competent from the imagination and powers of drawing, shown in the sister arts of either sculpture or painting (and often both) up to that period; and it will be my object to point out, though the existing examples of the various periods render it scarcely necessary, that as long as this state of things lasted, the buildings produced were remarkable for originality of thought and beauty of design; but when men came to give their attention to architecture alone, their imagination was less exercised, and a less amount of knowledge of drawing was considered necessary, whereas the other arts cannot be practised at all without them; and the architects being no longer artists in the same degree as formerly, the practical, or rather scientific part of their two-fold character, began to have the pre-eminence, and the consequence was, that gradually precedent took the place of originality, and measured proportions, and forms copied from ancient works, and composed principally of straight lines, took the place of the free lines of the pencil and the artistic reproduction of natural forms. In going through Vasari, whose work I have found sufficient for my purpose, one of the first passages that arrested my attention was in the life of Cimabue, a painter alone, and which is as follows:—

"By these and other works, Cimabue had acquired a great name, as well as large profits, and was appointed, together with Arnulpho Lupi, an artist then greatly renowned in architecture, to superintend the building of Santa Maria del Fiori, in Florence;" those that had the direction of the work evidently thinking that his taste and experience in art, though in a different branch, would be of great service to the work. The first architect we find noticed is Buono, who was sculptor as well, a list of his works being as follows:—

The Castel del Uovo and Castel Cupoano, Campanile of St. Mark, Venice; St. Andrea, of Pistoria, the marble architrave over the door of which containing many figures in the Gothic manner, name and date 1166, was sculptured by his own hand; the enlargement of Santa Maria, at Florence; and the Palace of Arrezzo, showing that those who were skilled in sculpture were nevertheless entrusted with important architectural works. But to see more fully the way in which they managed these matters in those times, and the gradual change that took place in the mode of practice, and consequently in the works produced, let us inquire with this view into the lives, education, and practice of a few men whose names are well known in the history of architecture, and many of whose works are at the present time the object of admiration and study. * * * *

Let us first take Arnulpho, born 1232, died 1310, architect of Sta. Maria del Fiori, and of the Or San Michele. We do not know much of his education. Vasari says that he acquired the art of architecture from his father, Jacopo IV. (note this), studied design under Cimabue, for the purpose of employing it in sculpture; he was also a pupil of Niccola Pisano, altogether an education not often considered necessary in the present time, being as though a student of architecture were now to learn composition and constructive architecture with an architect, as at present; and, in addition to that, the art of design from Eastlake, and that of sculpture from Gibson. And what was the result? Two of his works are Santa Maria del Fiori, and the beautiful building, originally designed by him as the corn-market, and thus called the Loggia of Or San Michele. This education did not, however, spoil his practical usefulness, as it was by his advice that the Florentines issued a decree that no building should ever after be erected on the river banks, when they had sunk; and much ruin would have been saved, says Vasari, had the decree always been adhered to. In 1285 he founded the Loggia and Piazza of the Priori, rebuilt the principal chapel of the Badia of Florence, the campanile of the same church, and the church of Sta. Croce, after which came his great work of the Duomo, or Santa Maria del Fiori, "in which," says Vasari, "he proceeded with so much care and judgment, making his excavations wide and deep, and filling them with excellent materials, such as flint, and lime, and a foundation of immense stones, that they have proved equal, as we still see, to the perfect support of that enormous construction which Filippo di Brunelleschi erected upon them, and which Arnulpho had probably not even thought of placing thereon."

His next works were the city walls and gate towers, after which he designed the Palazzo di Signori; after which many other works, among which was the tomb of Cardinal Bruye, in the church of San Dominico, at Orvieto, where he displayed equal power as an architect and mosaic worker. At length, at an advanced age, he died, laden with honours, in 1310.

* Read by Mr. Druce, at a meeting of the Architectural Association, held on Friday, December 11th.

His original model for Santa Maria, showing the manner in which he intended carrying the dome immediately above the piers, was lost, with those of Brunelleschi, they being apparently not more careful of the original models of their great masters than we of Wren's of St. Paul's.

Having traced the career of one who, though well skilled as a sculptor, yet applied himself almost exclusively to architecture, and whose greatest works are in that art, we now come to one who was educated and practised as a sculptor, and whose great work is in sculpture, he was, from his fame in that art, chosen to design and superintend works of architecture; namely, Niccola Pisano, born 1205, and died 1278, who is celebrated as having opened a new road to sculptors, and by his practice and influence led the way to truth and nature. He was born at Pisa, and according to Vasari, his first lessons were from Greek or Byzantine sculptors at work at the figures and other ornaments of the Duomo and the Baptistry; but, according to other Italian writers, from Pisan artists; but his chief instruction was derived from the diligent study of antique sarcophagi, then at Pisa, in which, says Vasari, "The nude, as well as the draped figures, were perfect in design, and executed with great skill." This, of course, in the then existing state of sculpture, gave him such a correctness of outline and finish that placed him above all others of his time. "His first work," according to Vasari, "was a tomb in marble to San Dominico, founder of the order of Preaching Friars, and in 1231 he completed the construction of the tomb, with the many figures still to be seen upon it, to the great extension of his fame, the work being considered one of extraordinary merit, and superior to anything that had then been seen. While engaged on this work, he also prepared plans for the re-building of the church and the greater part of the convent." I take this opportunity to point out in the works of Niccola and others more particularly given to sculpture, an advantage the inverse of that which I am advocating as applied to architecture of the same man uniting the two arts, that while the architecture becomes sculpturesque and artistic, on the other hand, those works, such as monuments, tombs, &c. generally entrusted to sculptors, and in the present time generally consisting of one statue, and the pedestal neglected, or if attempted to be decorated, barbarous in the extreme, become architectural in their character, meriting the term construction, and enriched in the present instance with many figures; for as long as the architect lacks power of drawing, and the sculptor the art of architectural composition, no perfect work can be executed in either art.

To show that the sculptor and artist is not necessarily a bad constructive architect, note that Niccola was the first to found buildings in Pisa, where the soil is so bad for foundation on arches raised on piers, which in their turn were supported by piles—for, says Vasari, "where this was not practised, the whole edifice was frequently ruined by the sinking of the foundation, whereas the piles rendered all entirely secure, as experience fully demonstrates."

One work noted is a deposition of our Saviour on the façade of the church of San Martino at Lucca, which is full of admirable figures. After many other works, we come to the well-known church of St. Antonio of Padua, of which I have a sketch, and also the church of the Frari at Venice, sketches of which are in Street's "Brick and Marble Architecture." Another interval of unknown works, and we come to the marvellously beautiful pulpit in the baptistry at Pisa, and that at Sienna. Thus we see in these few notes what seems to us a singular mode of practice. At one time we have a man diligently studying classic figures, and showing the result of his studies in a tomb noted for the beauty of its many figures (not one, remember). At another we find that his skill in composition, as shown in this, has, as we should now say, got him a job in architecture. His success in this gains him many others, which cause him to travel to Rome, Naples, Venice, and other places. We next hear of him, chisel in hand, at Lucca, at a deposition, and finally achieving his great triumphs in sculpture—*i.e.* design and execution—in his native city and at Sienna. Soon after which we find him retiring from his labours to Pisa, and leaving his two-fold practice to his son,—

Giovanni Pisano, sculptor and architect.—Now let us mark his education: Vasari says, that being constantly with his father, he attained early proficiency both in sculpture and architecture, so that in a few years he not only became equal to his instructor, but, in some respects, surpassed him; and what was the result? A tomb was wanted at this time at Perugia, to Pope Urban IV. who had just expired. What did the Perugians do; give the job to some incompetent townsman? No; they wanted a first-rate work: Niccola had indeed retired, but Giovanni had qualified himself to succeed him, so Giovanni was employed, and, as is sure to be the case when a man has really qualified himself for his work, this first work immediately led to another: a water-course had been just made to the city, a fitting fountain was required for it, "they now, therefore," says Vasari, *i. e.* being satisfied with his first work, "confided the erection of the fountain, with all its ornaments, whether in marble or bronze, to Giovanni Pisano." And now let me ask, how many of our existing sculptors would make a fitting, harmonious, and architectural design; how many of our architects would successfully design and execute the details, figures, &c. and why? I think from the want of Giovanni's education; he, while qualifying himself for his profession as a sculptor, which secured the detail, bore in mind that he would some day or other be called upon to design buildings, which secured the composition and constructive knowledge. This undertaking being completed; mark this, as he was a sculptor, executing the stone carving himself, and making the casts for the bronze work, he could not leave till it was finished. He left Perugia for Pisa to see his father, who was ill; but passing through Florence he was compelled to delay some time there, for the purpose of assisting with other architects at the mills on the Arno, which were then in course of construction. "Hearing of his father's death," says Vasari, "he departed for Pisa, where, in consideration of his talents, he was received with great honour by all the city, every one rejoicing that although Niccola had passed away, yet Giovanni remained to them, the heir to his virtues as well as his abilities." Do we ever hear now of an architect being received in this way on his return to his native city after executing two or three works in London, or any other place; and why not? I do not mean to the same extent, for we are not so excitable or enthusiastic on any matters as the Italians of the present day, much less as the Italians of those days in the matter of art. We do not, you will say, take any works of our great painters in triumph through the streets as the Florentines did that of Cimabue; therefore you cannot expect that they will accompany any of our great architects through the streets of his native city; but I will remind you that a great soldier is received with as much enthusiasm as we are capable of; and moreover, a great painter or sculptor alone is also treated with the same honours if he happens to visit his native place; but when did we hear of a great architect being thought so much of, or treated in the same manner? And why is this? you will perhaps say. Partly because comparative excellence is not so clearly defined, and partly because the public do not value architecture so much as they do the other arts. True; but we must go deeper. Why is comparative excellence difficult to define, and why do not the public appreciate this art as much as the others? I will tell you why, in my humble opinion. Because in the profession itself it is looked upon and treated more as a business than an art, because, in training young men to an art that requires an intimate knowledge of the other two sister arts, to an art to which the others are often called upon to become handmaids, and which requires all the outline drawing, and at least some knowledge of the execution of the sculptor, and all the subtlety of composition, and some of the knowledge of colour of the painter; all this is often ignored; the extent of drawing is confined to a small power of sketching buildings. The other knowledge required to raise works of architecture to works of art is left unlearnt. A little archæology and a large supply of works on old buildings are substituted, which, as most make use of them for reference to Classic or Gothic buildings, may, perhaps, account for the difficulty of defining comparative merit, which is never the case when men are alone dependent upon their imagination, power of drawing, and study of nature. Moreover, the public know, to a certain extent, the amount and difficulties of the attainments considered necessary, and respect the profession accordingly. But to return to Giovanni—the Pisans did more than *fête* him, for the men of those days were greedy to possess the works of their great artists. As his first work had been in another city, and had proved his talents and acquirements, they resolved that their city should also be enriched by his works, for, says Vasari again, immediately after recording his triumphant reception, "Nor were the Pisans disappointed when the occasion came for putting them (his abilities) to the proof, for, resolving to make certain changes in the small, but richly-adorned church of Santa Maria della Spina, the charge of these was entrusted to Giovanni, who, with the aid of his disciples, brought the decorations of that oratory to the perfection we now see." His success in this last work caused the Pisans to confide to him the design and execution of the Campo Santo, which I need not tell you was successful also. After which followed many works, including, Vasari says, "the *façade* of the Duomo at Sienna, the high altar of which he covered with figures, foliage, and other ornaments in relief, the whole work being bisected into compartments by fine mosaics and enamels on plates of silver, fixed into the marble with great nicety and care." While engaged in restoring a convent, he received a commission to execute a pulpit for the church of Sant Andrea, similar to what Niccola had executed for the cathedral of Sienna. This took Giovanni four years. At this time, having executed so many famous works, like a true artist, considering that he was always a student, he resolved to proceed to Rome, that he might profit, as his father had done, by the study of the few antiquities then to be seen there; but this design he afterwards abandoned, and returning to Pisa, he was commissioned to execute the pulpit in the Duomo: he also executed figures on the tympana of two of the doorways of the same building. His last work was a small chapel in the church at Prato, to contain the girdle of the Virgin, which, having been stolen, the people, as usual, resolved to put it in a safe place. He died in 1320, and was honourably interred in his own work, the Campo Santo. Besides being an architect and sculptor in marble, Giovanni was also a worker in ivory.

We next come to a master-mind, one who has produced one of the world-known treasures of architecture, yet who nevertheless, under the present system, would not have turned his attention to architecture at all, and the world would consequently have been deprived of his work, for during many years of his life he was a painter alone,—need it be said that I allude to Giotto (born 1276, died 1336),—thanks to the system of those times, styled by Vasari, in the heading to his life, painter, sculptor, and architect; and do you think his work in architecture would have been so beautiful had his mind, eye, and hand not been previously trained by his long course of painting, and consequent long study of nature? I am sure not. It is the only way. You cannot get water out of a dry well; and even the study, *i.e.* the knowledge got by the study of nature, is of no use if you have not the power of hand and eye to reproduce her forms and those with which the mind becomes filled; and this can only be attained by years of practice.

So that in Giotto's case, his education as an architect, *i.e.* a designer of architecture, was his practice as a painter. But you must always bear in mind that it was the system or custom of combining the arts that rendered it practicable. I would not pretend to say that at the present time any one of our great painters, after ten or twenty years' practice in painting alone, would make a good architect, or even perhaps turn out a really good design. Though he would possess three of the great desiderata, viz. power of drawing, experience in composition, and continual study of nature, he would lack a fourth even to practise architecture as an art, viz. the power of applying these acquisitions to architecture; but the artists of those days, whether painters or sculptors, knowing that their fame in their special art would very probably lead to employment in architecture (a first-rate artist of any kind being looked upon as the best designer of the day, and, consequently, the most fit man to whom to confide any work which it was wished should possess peculiar beauty), took care in their leisure time (which was not much in those days when church walls were not of white-wash or colourless plastic) to qualify themselves for such an emergency, and often to such a degree that, as we have seen in the life of Niccola Pisano, a sculptor, that their works are noted as models of construction as well as of beauty. With regard to Giotto's early life, all are well acquainted with the story as told by Vasari. * * * A remark occurs to me now, in looking over the list of works of Giotto—a painting which may as fittingly come here as anywhere else—that in those days the painters and sculptors had great opportunities of studying cotemporary architecture, as nearly all their works, instead of being executed in their own studios, were done on or within the walls of the churches, religious houses, and other public buildings; and I can well imagine that the artists' minds were occupied during many a spare five minutes of rest from their labours in admiring and observing the buildings whose walls they were enriching, and much knowledge was probably in this way stored up and made use of when the opportunity occurred.

It is not my intention, nor would time permit me to make mention of any of the extraordinary numbers of paintings executed by Giotto, or to endeavour to trace the events of his life, which would, indeed, be much the same thing.

However, Vasari goes on recounting his principal works, till we come upon this:—"In the year 1327 Guido Tarlati da Pietra Mala, bishop and lord of Arrezzo, died at Mossa di Maremma, when returning from Lucca, whither he had gone to visit the emperor, and his body was carried to Arrezzo, where it received the honour of a most solemn and magnificent funeral. It was then resolved by Piero Larcome and Dolpho da Pietra Mala, brother of the bishop, that a sepulchral monument in marble, worthy of the greatness of a man who had been lord spiritual and temporal of the city

as well as chief of the Ghibellini party in Tuscany, should be raised to his memory. They wrote accordingly to Giotto, requesting him to prepare designs for a very splendid tomb, adorned with whatever might most worthily enrich it, and, sending him the required measurements, they prayed him at the same time to procure them a sculptor, the most excellent, according to his opinion, that could be found in Italy, they referring the whole affair entirely to his judgment. Giotto, who was very obliging, made the design and sent it to them, when the monument was erected accordingly, as will be related in its proper place," *i. e.* in the lives of the selected sculptors, Agostino and Angelo, of Sienna. Here, then, is an instance of what I remarked above, viz. that the greatest artist of the age, whatever his special profession, was looked upon as the greatest designer, and therefore called upon when any work more than usually beautiful in design was required, whether in his peculiar province or not. After this we hear of no more works in sculpture or architecture till we come to the following:—"After completing these works, and on the 9th July, 1334 (*i. e.* if the dates are correct, when he was fifty-eight years old, and only two years before his death), Giotto commenced the campanile of Santa Maria del Fiori. The foundations were laid on massive stones, sunk twenty brachia; he caused the remainder, namely, eight brachia, to be formed of masonry. The bishop of the city, with all the clergy and magistrates, were present at the foundation, of which the first stone was solemnly laid by the bishop himself. The edifice then proceeded on the plan before mentioned, and in the Gothic manner of those times; all the historical representations which were to be the ornaments being designed with great care and diligence by Giotto himself (would that the architects of the present time would do so, and not leave so much work to the carver), who marked out on the model all the compartments where the friezes and sculpture were to be placed, in colours of white, black, and red. The lower circumference of the tower is of 100 brachia (25), that is, one each of the four sides. The height is 144; and if that which Lorenzo di Ghiberti has written be true, as I fully believe it is, Giotto not only made the model of the campanile, but even executed a part of the sculptures and reliefs—those representations in marble, namely, which exhibit the origin of all the arts. Lorenzo also affirms that he saw models in relief from the hands of Giotto, and more particularly those used in these works,—"An assertion that we can easily believe," continues Vasari: "for design and invention are the parents of all the arts, and not of one only. This campanile, according to the design of Giotto, was to have been crowned by a spire, or pyramid, of the height of fifty brachia; but as this was in the old Gothic manner, the modern architects have always advised its omission, the building appearing to them better as it is. For all these works, Giotto was not only made a citizen of Florence, but also received a pension of 100 golden florins yearly—a large sum in those times—from the Commune of Florence. He was also appointed superintendent of the work, which he did not live to see finished, but which was continued after his death by Taddeo Gaddi" (also a painter), so we see now the connection between the shepherd-boy and the Giotto Campanile. Years have gone by—educated by a painter as a painter, and living and practising as a painter, almost exclusively, till he was fifty-eight years old, we now see his powers of drawing, subtlety of composition, his long experience as a designer, his long study of nature, and his matured and full imagination at last concentrated on a work of architecture, as if it was intended to be a lesson for us, that it is not a light thing when we sit down, pencil in hand, to design a work intended to last for centuries; that they are not light acquirements that the art requires; that it is an injury, rather than a benefit, that our knowledge of construction and building is good and that the walls will stand for ages, if, at the same time, our preparation of our powers of design has not been commensurate with the importance of the art, and with our skill in making our work permanent; if, in fact, our art is not worth preserving, for the pleasure, the instruction, and the benefit of succeeding ages. Do not for a moment misunderstand me: I do not say, know less of constructive skill,—you cannot know too much; how grievous, for instance, would it have been if there had been the slightest flaw or sign of weakness in this building, upon which so much art has been lavished by Giotto, if his parting gift had perished from bad construction. No; the constitution should be good, and the bone and muscle strong, where the form is so beautiful,—but still the form should be worthy of the bone and muscle. But, mark the way in which this great artist set to work: from his previous life perhaps it might have been imagined that a dashing sketch would have been the way in which his imaginative design would have been communicated; but, no. Should we then have had the full benefit of all his knowledge and experience? No; he himself must make the model, or the proportions would not have been sufficiently considered. All the detail must be marked out by himself, or the design would not have profited by his powers of composition. The coloured decorations must all be designed by him, or we should not have derived all the full benefit of his having been a painter; and, lastly, all the detail itself must be designed by him, and, as far as he was able, modelled by his own hand, or of what avail to the work would have been the marvellous power of drawing possessed by its designer? Only two years after the first stone of this great work was laid, Giotto died, in 1336. I cannot better conclude my few notes of his life than by quoting, with your permission, the last few lines of "The Lamp of Beauty," in "The Seven Lamps," expressing, as it does, all my views in so much more glowing words:—"And if this be, as I believe it, the model and mirror of perfect architecture, is there not something to be learnt by looking back to the early life of him who raised it? I said that the power of the human mind had its growth in the wilderness; much more must the love and conception of that beauty, whose every line and hue we have seen to be, at the best, a faded image of God's daily work, and an arrested ray of some star of creation, be given chiefly in the places which He has gladdened by planting there the fir tree and the pine. Not within the walls of Florence, but among the far-away fields of her lilies, was the child trained who was to raise that headstone of beauty above her towers of watch and war. Remember all that he became; count the sacred thoughts with which he filled the heart of Italy; ask those who followed him what they learned at his feet; and when you have numbered his labours, and received their testimony, if it seemed to you that God had verily poured out upon this his servant no common nor restrained portion of his spirit, and that he was indeed a king among the children of men, remember also that the legend upon his crown was that of David's:—'I took thee from the sheep-cote, and from following the sheep.'"

As Taddeo Gaddi—born 1300, died 1366—was the successor of Giotto in the superintendence of the works of the campanile, we will next consider a few passages from the life of this master, who was his godson, and who was with him for twenty-four years; "and, after his death," says Vasari, "was considered the first in his art, for judgment, genius, and other artistic qualities, being superior in most of these to all his fellow-disciples." After enumerating many works on painting, we come to this passage:—"Having returned to Florence, Taddeo continued the works of Orson Michelle for the commune of the city, and refounded the columns of the Loggia, for which he used stone, dressed and hewn, instead of the bricks of which they had previously been formed, but without altering the design left by Arnulpho, who had directed that spacious magazines should be prepared above the Loggia, with vaults for storing the reserves of grain laid up by the people and commune of Florence;" and that you may see in how much earnest the authorities and people were in their practice of the art of architecture, as well as the artists, allow me to read the following passage, which I am the more induced to do, as I hailed as a sign of better times the revival to the letter of one of the modes of proceeding here alluded to. Hear Vasari—"And to the end that this work might be completed, the guild of Porta Sta. Maria, to whom the charge of the fabric had been entrusted, commanded that the tolls of the Corn-market, the tax of the Piazza, and other imposts, should be made over to the building; but, what was of more consequence, it was further ordained, and with great judgment, that each of the guilds of Florence should construct a column at its own charges, and should furthermore place a statue of its patron saint in a niche of the same. It was, moreover, decreed that every year, in the festival of each saint, an officer of the respective guilds should make a collection, standing each by his own column, during the whole day, for that purpose, with standard elevated and ensigns displayed." The revival I heard of the other day, when in Oxford, was, that each of the principal heads of colleges and others had contributed a column to the museum. In 1331, he was called upon (Giotto being at Milan) to prepare a model and design for the Ponti Neccheo, his instructions being to construct it with all possible beauty, as well as solidity. The bridge of San Trinita was also built by him. "While all these architectural works," says Vasari, "were proceeding, after the designs and under the direction of Taddeo, he did not neglect his paintings"—he painted whole chapels and other works. He died at Milan.*

Architectural Exhibition.—The opening *conversazione* will be held at the Gallery in Suffolk-street, on Saturday, the 2nd of January. Professor Cockerell will preside.

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* To be continued.

ON THE ARTS CONNECTED WITH ARCHITECTURE IN TUSCANY.*

There is no district of Europe entitled to greater respect from all who honour art than was that portion of Italy, during the thirteenth, fourteenth, and fifteenth centuries, which we now recognise as the Duchy of Tuscany; tested indifferently by the excellence and variety of its monuments, the spirituality of its artists' productions, or the honourable consideration in which their works were held by all ranks of society. This high distinction was in a great degree due to a fortuitous union of elements in the constitution of Florence in the thirteenth and fourteenth centuries such as may never again recur. The favourable position of the city for commercial pursuits, and probably some congenial sympathy on the part of the citizens, early made it the seat of a prosperous trade in, and manufacture of, woollen goods. Its association with the Ghibeline cause nourished aristocratic feelings of veneration for feudal nobility, while the sanctity of the relics with which its earliest religious structures were endowed, fostered, more particularly among the democracy, a fervent devotional respect for everything ecclesiastical. Through these three sources,—an enlightened oligarchy, a proud nobility, and an ever-active Church,—ample patronage was provided for artists; and, as has ever been the case, genius sprang to life in profusion at the all-powerful summons of wealth and honour.

There was, however, yet one more charm of great potency at work to aid, and which indeed mainly generated the particular class of excellence to which I propose to draw more special attention. I allude to that particular veneration for technical excellence and honest work which the municipality expressly desired should characterise every work of art for which they gave a commission. Men whose fortunes had been made by the reputation of their skilful weavers, and of their sterling florin,—the only pure gold coin of its time,—could scarcely tolerate, in those magnificent structures which were to be the outward and visible emblem to foreigners of their state, either bad work or dishonest material. Handicraftsmen of all kinds were honoured each in their several degrees: guilds and confraternities were erected with special privileges; and the services of all were enlisted to heighten with every external magnificence the pageants of the community, and the monuments of architecture and its sister arts, which were to be produced for the public enjoyment, and yet more for the public honour. The triumph of the artist was to Florence the triumph of one of its skilful children, whose talent was the manifest source of ease and prosperity to all. Hence the public rejoicings in the "Borgo-Allegro" over the strides made in painting by Cimabue; the public gratulations over the exquisite manipulation of marble work and mosaic by Orcagna, in the Or San Michele, over the brilliant ability of Donatello, Ghiberti, and Luca della Robbia, in sculpture, and over the originality of Giotto, and the daring of Brunelleschi in architecture.

The public buildings in those palmy days of art were looked upon as demanding the co-operation of all; and as each man who brought of his best to the work received, at the hands of his fellow-citizens, both in money and good esteem, the full value of whatever he added to the common stock of beauties, neither the greater men were permitted to appropriate the honours of the less, nor were the less permitted to filch the credit due to the loftier spirits. Hence arose a co-operation among artists and artizans of all kinds such as has been scarcely ever known in the world's history, and hence is derived much of the peculiar excellence and interest of the principal structures time has spared to us upon the almost classic banks of the Arno.

It had been my intention to dwell upon many of the technical arts which contribute to this excellence, but heavy and unexpected engagements have curtailed the time at my disposal, and I have been forced to limit my attention to three of special interest;—viz. stained glass, which has not received the attention it deserves at the hands of art students; painting in fresco, which is so eminently characteristic of all Early Italian architecture, and Tuscan in particular, and marquetry, of which Tuscany appears to have been at least the European nursery.

Amongst all the arts connected with architecture, there is not perhaps one so capable of imparting splendour to a building as that of stained or painted glass; a fact which appears to have been known and practically applied from the earlier period of the Christian era to within the last century or two. In the first recorded examples nothing more appears to have been attempted than filling in windows with a species of mosaic-work of different coloured pieces of stained glass; nor is it until the eleventh or twelfth century of our era that we have satisfactory records

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* The following is part of a paper read at the general meeting of the Royal Institute of British Architects, on November 16th, by Mr. J. B. Waring, already referred to.

of the application of figure-subjects in this method of decoration,—a system which reached its apogee, with all the other decorative arts, in the fifteenth and sixteenth centuries. There are three methods of executing these glass pictures, which may be termed the Mosaic, the Enamel, and the Mosaic-Enamel. In the first, the composition is formed of small pieces of stained glass, or glass coloured throughout by metallic oxides, termed pot-metal, welded together in small pieces, and producing all the required tints in local colour: the shadows, which are slight, are produced by the application of enamel colour upon them with a brush, and then fixed by burning in a kiln: the best examples of this class are, perhaps, those of the twelfth and thirteenth centuries. In the second, or Enamel method, which was most in vogue during the sixteenth and seventeenth centuries, the artist painted his subject entirely with enamel colours on a ground of white glass, sometimes on one side only, sometimes on both; the entire design being welded together in pieces of much larger size than those usual in the Mosaic method; and, when complete, fixed by exposure to heat in a kiln. In the third, or Mosaic-Enamel method, we find a combination of both the former: it was the most in vogue, as might naturally be supposed, at a transitional period between the first and second methods, and is, indeed, characteristic of the works of the fifteenth, and of the early part of the sixteenth century. In this method, the use of pot-metal for the large masses of colour imparts all that brilliancy and power which is peculiar to the material; whilst the use of enamel colour for the more delicate portions of the picture, as the flesh, the hair, the ornaments, and the general accessories, permits a delicacy and minuteness of finish otherwise unattainable. * * * *

In the revival of this art during the present century, the artists of France, Italy, Belgium, and Germany have taken the lead, and far surpass any efforts made by the English; yet in the best of these there is much that is unsatisfactory, and neither in drawing, colour, nor solidity, do they bear any comparison with the best works of the fifteenth and sixteenth centuries in Tuscany. This arises principally from an insufficient adoption of pot-metal in the masses of colour, the false idea that the numerous lead lines of the small pieces of glass in the mosaic method are antagonistic to the general effect,—the contrary, I believe, being certainly the case,—the insufficient use of large masses of shadow, and too minute attention to blending the several local colours: such were the defects which struck me in the otherwise beautiful works of Capronnier of Brussels, and of Bertini of Milan, in the Great Exhibition of 1851, and in those of Petit Gerard of Strasburg, of Lafaye, Gérante, and Lusson, of Paris, and of Vincent Larcher of Troyes, in the Paris Exhibition of 1855.

The notices of the magnificent stained-glass windows of the Duomo of Florence are very meagre: some of them are merely stated to have been executed in 1434 by a Florentine artist, Domenico Livi da Gambassi, at Florence, who had learnt the art at Lubeck. This may apply to the series of which an example is given, though that even appears improbable, and some of the subjects in the upper windows of the transepts, of which St. James is an example, are certainly of much earlier date. The entire series is remarkably rich in colour, and consists of the prophets and kings of the Old Testament, and the Apostles and Saints clad in most picturesque and striking costumes, such as Freiligrath describes in his "Pictorial Bible," presenting a fine example of those "storied windows richly dight" which Milton has celebrated in verse.

They are formed of small and irregular pieces of stained glass, and in the *ensemble* present no extreme delicacy of execution nor peculiar depth of shadow; the effect being obtained by a rich combination of colours, excellently arranged, and very much in accordance with the scientific principles enunciated by M. Chevreul: the robes are seldom of one plain tint, but are richly worked with ornamental patterns of a bold and effective character. The faces and drapery are seldom strongly marked in shadow; and the former, though in some cases, as in Moses and the king, very finely expressed, yet in others, as in St. Simplicius, are very rudely formed,—a defect, however, not easily remarked at the distance they are placed from the eye, whilst the object which the artist evidently sought, namely, a rich combination of colour, is perfectly obtained. The dark leaden lines with which the small pieces of glass are welded together, without any regard as to where they occur, are also lost in the distance; while the important result is produced by means of these black lines, that much greater solidity and a much stronger effect of colour are obtained. They give increased contrast and distinctness to the separate colours and to the entire composition, which, if not treated in this manner, is apt to become confused and flimsy-looking even at a short distance: indeed, it may be taken as a general axiom, that the blending of tints, unless in subjects very close to the eye, should be avoided in stained glass as simply labour thrown away.

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Proceeding now to fresco as an ornamental adjunct to architecture, we find that between the Byzantine epoch, when mural decoration could boast of the rich and solemn effect produced by the use of mosaic inlay, and the revival of the art of painting in the fifteenth century, there extends a long period, embracing the works of the Romanesque and Gothic styles, neither of which has been illustrated in the manner they deserve; an omission arising chiefly from the few remains which exist at this day in a perfect state, at least in the Cisalpine countries. As regards the first-named style, we have frequent records that painting was extensively applied as an internal decoration, where mosaic-work could not be obtained; and we constantly find notices, during the eleventh and twelfth centuries, of the walls of churches being covered with painted subjects, illustrating the Sacred Writings or the lives of particular saints. * *

The general characteristics of this Italian Gothic, or Giottesque style of mural decoration are,—a dado, or base, panelled with imitations of various marbles, contained within borders painted in imitation of the glass mosaic-work usually known as Opus Grecanicum, having at times central designs of intricate geometrical and leaf ornament. About 6 feet from the floor is a cornice with small brackets or consoles, all radiating in perspective to a central point of sight: above this the wall is divided into large compartments, containing historical or religious figure subjects, the figures being strongly outlined, and the colours flat and distinct, with but a slight use of chiaro-oscuro. These compartments are also enclosed in painted mosaic borders, and beneath each there is a description of the subject illustrated, written in peculiar Gothic letters of a very good style. The vaulting of the roof springs immediately from above these pictures, the only actual projection being one large central rib, ornamented with winding foliage and mosaic borders, and painted mouldings to carry it more agreeably on to the flat surface of the vaulted compartments, which are almost always painted of a deep blue, studded with gold stars, and in the centre of each of which are painted figures, usually holding written scrolls descriptive of their meaning. Sometimes the names are written on the clouds beneath, from which they frequently appear to rise. The intersection of the rib is marked by a gold boss, carved and gilt, but not of great size, having a ring in the centre, from which a lamp was suspended. The ornament is generally a mixture of mosaic-work, Roman reminiscences, especially in the painted mouldings, and transcripts from nature; the two first, however, being predominant. The colours are well arranged, and the ornamental accessories, such as dresses, buildings, thrones, armours, &c. are of great variety and beauty, and very carefully executed.

Such are the general characteristics of most of the mural decoration in vogue up to the close of the fifteenth century, as seen in the works of Orgagna at Pisa and Volterra, of the Lorenzetti and Bartoli at Siena, and in the several Italian schools of Italy. And although the works of Paolo Uccello, Masaccio, Ghirlandaio, and Signorelli, present many points of divergence, the principal feature being the greater importance attached to the historical subjects, and a very superior style of execution, yet it is not until the time of Perugino that we find a completely different system adopted; and to him appears to be certainly due the introduction of a style in every way superior, which was extended and improved by his contemporaries and pupils, amongst whom Pinturicchio and Raffaelle are most prominent.

I will now bring under your notice the last division of my subject, which is the art of marquetry, or inlay in wood. Although a passage in the treatise of Theophilus on Painting (twelfth century) appears to bear on the practice of working in several kinds of wood,—"cupri, ferri, *lignorum*, lapidumque,"—yet the earliest examples with which we are acquainted are to be found on the ivory boxes, ornamented with inlay of various-coloured wood, chiefly manufactured at Venice during the fourteenth century. In these the art was only employed as an adjunct; and it is not until the close of the fourteenth or the commencement of the fifteenth century that we find it applied as an ornamental art by itself, and developed on large surfaces. Vasari and Lanzi state that Brunelleschi gave lessons in perspective and tarsia, to architects and others, of which Masaccio, in painting, and Benedetto da Maiano, in his inlaid works, availed themselves. Vasari says that several works of the kind were executed by the old masters, "da nostri vecchi," and were termed by them works in "tarsia," or intarsiatura. In his life of Benedetto da Maiano, he states that this practice was first introduced in the time of Brunelleschi and Paolo Uccello, "that, namely, of conjoining woods, tinted of different colours, and representing with these, buildings in perspective, foliage, and various fantasies of different kinds." The earliest artist in this manner mentioned by Vasari, is Giuliano de Maiano (1432—1490), architect and sculptor, who commenced his artistic life with works in *tarsia*, and executed, as his first work, the seats and presses of the sacristy in the Church of the Annunziata at Florence, with Giusto and Minore, two masters of tarsia. * * * * *

The moral that may be deduced from these few observations on some out of the many arts associated in the production of the great monuments of Tuscany, is the following:—It has been the great misfortune of architecture, from the last century up to the present time, to be considered as a study *per se*; as an art perfect in itself, and requiring no adventitious aid from the sister arts of sculpture, painting, &c.; but if we search antiquity through, we shall find no example of such a disconnection of the one from the others; and those buildings are the most interesting, the most beautiful and satisfactory, which have sought the aid and guided the aim of all those varied and ingenious methods of ornament, which the skill of mankind has discovered and brought to perfection. It is true that constructive science is of primary importance to the architect; yet it can do no more than form the skeleton which it is his duty to render, not merely useful, but agreeable to the eye; and in order to effect this, he must of necessity call in the aid of the artist in stone, in colour, in metal, in wood and mosaic work, and possess the knowledge and good taste requisite to apply them effectively to his subject: the useful should never be separated from the beautiful: the last is the complement of the first, of which every work of the Divine Creator, the great Architect and Artist of the Universe, affords striking and inimitable proof.

To one deeply penetrated with this feeling, the study of architecture is no longer confined to the few years spent in an office to obtain a knowledge of the different styles, and the usual methods of professional business, but demands long-continued attention to all the arts of design, with a view to their general application to architecture. And here let me say a word on the subject of servile imitation—an evil almost necessarily attendant on the revival of any style or manipulative art. Novelty and beauty excite admiration, and naturally produce imitation: but this will be only for a time; for we should not be human beings if finally we did not endeavour to strike out a new path for ourselves; and then it is that we shall bring to bear our knowledge, not for the purposes of imitation, but of progress. With all just deference to the studies of our predecessors, with all our admiration for the styles of the past, our present object should be to consolidate and arrange the information we now have; and from the lessons thus gained, the examples thus given, strike out a new path for the powers of the architect, and bring back the art to its normal state, which is one of gradual but sure progress, founded on scientific and artistic knowledge: we should perceive that merit exists more or less in all styles, and is irrespective of fashion, which is mutable and often unjust; that the *principles* of our art are fixed and certain; that however much long-received rules may be altered as circumstances may require, they are not to be despised or disregarded without careful consideration; that true construction is the vital principle of real progress; and that, besides the excellent and numerous examples of ornament we already possess, Nature has still varied and inexhaustible resources in store for our study; and above all, that for the appliance of these means at our disposal, an earnest study, a just appreciation, a practical knowledge of *all* art, are indispensably necessary, and can only be obtained by an industrious use of the hand and of the eye, as well as of the mind.

But to what purpose should we do this? What incentive has the architect of this country, and this day, to undergo an education of so protracted and so difficult a nature? Let it be owned at once, that the artist's own improvement, and the development of his own powers, with the personal pleasure consequent thereon, must be the only reward he can reasonably look forward to. Such studies for an architect are "as caviare to the public"—that public which requires builders not artists, and looks with jealousy and distrust on any architect who thinks more of his profession as an art than as a trade. How differently was the architect of the fifteenth and sixteenth centuries in Italy situated! In Tuscany especially, that classic home of art where the old Etruscan spirit, though dormant for centuries, rose from its temporary grave in all the glory and majesty of a bright resurrection, the appreciation and admiration of the public were not confined to one art or to one set of men, but to everything which was calculated to lend a grace and charm to all the requirements of civilized life. The church, the government, the municipality, the noble, the wealthy merchant, delighted to honour all that related to the arts, and the artist might labour

as well as chief of the Ghibellini party in Tuscany, should be raised to his memory. They wrote accordingly to Giotto, requesting him to prepare designs for a very splendid tomb, adorned with whatever might most worthily enrich it, and, sending him the required measurements, they prayed him at the same time to procure them a sculptor, the most excellent, according to his opinion, that could be found in Italy, they referring the whole affair entirely to his judgment. Giotto, who was very obliging, made the design and sent it to them, when the monument was erected accordingly, as will be related in its proper place," *i. e.* in the lives of the selected sculptors, Agostino and Angelo, of Sienna. 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The edifice then proceeded on the plan before mentioned, and in the Gothic manner of those times; all the historical representations which were to be the ornaments being designed with great care and diligence by Giotto himself (would that the architects of the present time would do so, and not leave so much work to the carver), who marked out on the model all the compartments where the friezes and sculpture were to be placed, in colours of white, black, and red. The lower circumference of the tower is of 100 brachia (25), that is, one each of the four sides. The height is 144; and if that which Lorenzo di Ghiberti has written be true, as I fully believe it is, Giotto not only made the model of the campanile, but even executed a part of the sculptures and reliefs—those representations in marble, namely, which exhibit the origin of all the arts. Lorenzo also affirms that he saw models in relief from the hands of Giotto, and more particularly those used in these works,—"An assertion that we can easily believe," continues Vasari: "for design and invention are the parents of all the arts, and not of one only. This campanile, according to the design of Giotto, was to have been crowned by a spire, or pyramid, of the height of fifty brachia; but as this was in the old Gothic manner, the modern architects have always advised its omission, the building appearing to them better as it is. For all these works, Giotto was not only made a citizen of Florence, but also received a pension of 100 golden florins yearly—a large sum in those times—from the Commune of Florence. He was also appointed superintendent of the work, which he did not live to see finished, but which was continued after his death by Taddeo Gaddi" (also a painter), so we see now the connection between the shepherd-boy and the Giotto Campanile. Years have gone by—educated by a painter as a painter, and living and practising as a painter, almost exclusively, till he was fifty-eight years old, we now see his powers of drawing, subtlety of composition, his long experience as a designer, his long study of nature, and his matured and full imagination at last concentrated on a work of architecture, as if it was intended to be a lesson for us, that it is not a light thing when we sit down, pencil in hand, to design a work intended to last for centuries; that they are not light acquirements that the art requires; that it is an injury, rather than a benefit, that our knowledge of construction and building is good and that the walls will stand for ages, if, at the same time, our preparation of our powers of design has not been commensurate with the importance of the art, and with our skill in making our work permanent; if, in fact, our art is not worth preserving, for the pleasure, the instruction, and the benefit of succeeding ages. Do not for a moment misunderstand me: I do not say, know less of constructive skill,—you cannot know too much; how grievous, for instance, would it have been if there had been the slightest flaw or sign of weakness in this building, upon which so much art has been lavished by Giotto, if his parting gift had perished from bad construction. No; the constitution should be good, and the bone and muscle strong, where the form is so beautiful,—but still the form should be worthy of the bone and muscle. But, mark the way in which this great artist set to work: from his previous life perhaps it might have been imagined that a dashing sketch would have been the way in which his imaginative design would have been communicated; but, no. Should we then have had the full benefit of all his knowledge and experience? No; he himself must make the model, or the proportions would not have been sufficiently considered. All the detail must be marked out by himself, or the design would not have profited by his powers of composition. The coloured decorations must all be designed by him, or we should not have derived all the full benefit of his having been a painter; and, lastly, all the detail itself must be designed by him, and, as far as he was able, modelled by his own hand, or of what avail to the work would have been the marvellous power of drawing possessed by its designer? Only two years after the first stone of this great work was laid, Giotto died, in 1336. I cannot better conclude my few notes of his life than by quoting, with your permission, the last few lines of "The Lamp of Beauty," in "The Seven Lamps," expressing, as it does, all my views in so much more glowing words:—"And if this be, as I believe it, the model and mirror of perfect architecture, is there not something to be learnt by looking back to the early life of him who raised it? 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THERE is no district of Europe entitled to greater respect from all who honour art than was that portion of Italy, during the thirteenth, fourteenth, and fifteenth centuries, which we now recognise as the Duchy of Tuscany; tested indifferently by the excellence and variety of its monuments, the spirituality of its artists' productions, or the honourable consideration in which their works were held by all ranks of society. This high distinction was in a great degree due to a fortuitous union of elements in the constitution of Florence in the thirteenth and fourteenth centuries such as may never again recur. The favourable position of the city for commercial pursuits, and probably some congenial sympathy on the part of the citizens, early made it the seat of a prosperous trade in, and manufacture of, woollen goods. Its association with the Ghibeline cause nourished aristocratic feelings of veneration for feudal nobility, while the sanctity of the relics with which its earliest religious structures were endowed, fostered, more particularly among the the greater men were permitted to appropriate the honours of the less, nor were the less permitted to filch the credit due to the loftier spirits. Hence arose a co-operation among artists and artizans of all kinds such as has been scarcely ever known in the world's history, and hence is derived much of the peculiar excellence and interest of the principal structures time has spared to us upon the almost classic banks of the Arno.

It had been my intention to dwell upon many of the technical arts which contribute to this excellence, but heavy and unexpected engagements have curtailed the time at my disposal, and I have been forced to limit my attention to three of special interest;—viz. stained glass, which has not received the attention it deserves at the hands of art students; painting in fresco, which is so eminently characteristic of all Early Italian architecture, and Tuscan in particular, and marquetry, of which Tuscany appears to have been at least the European nursery.

Amongst all the arts connected with architecture, there is not perhaps one so capable of imparting splendour to a building as that of stained or painted glass; a fact which appears to have been known and practically applied from the earlier period of the Christian era to within the last century or two. In the first recorded examples nothing more appears to have been attempted than filling in windows with a species of mosaic-work of different coloured pieces of stained glass; nor is it until the eleventh or twelfth century of our era that we have satisfactory records

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BAD PRINT

ORIGINA

of the application of figure-subjects in this method of decoration,—a system which reached its apogee, with all the other decorative arts, in the fifteenth and sixteenth centuries. There are three methods of executing these glass pictures, which may be termed the Mosaic, the Enamel, and the Mosaic-Enamel. In the first, the composition is formed of small pieces of stained glass, or glass coloured throughout by metallic oxides, termed pot-metal, welded together in small pieces, and producing all the required tints in local colour: the shadows, which are slight, are produced by the application of enamel colour upon them with a brush, and then fixed by burning in a kiln: the best examples of this class are, perhaps, those of the twelfth and thirteenth centuries. In the second, or Enamel method, which was most in vogue during the sixteenth and seventeenth centuries, the artist painted his subject entirely with enamel colours on a ground of white glass, sometimes on one side only, sometimes on both; the entire design being welded together in pieces of much larger size than those usual in the Mosaic method; and, when complete, fixed by exposure to heat in a kiln. In the third, or Mosaic-

axiom, that the blending of tints, unless in subjects very close to the eye, should be avoided in stained glass as simply labour thrown away.

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Proceeding now to fresco as an ornamental adjunct to architecture, we find that between the Byzantine epoch, when mural decoration could boast of the rich and solemn effect produced by the use of mosaic inlay, and the revival of the art of painting in the fifteenth century, there extends a long period, embracing the works of the Romanesque and Gothic styles, neither of which has been illustrated in the manner they deserve; an omission arising chiefly from the few remains which exist at this day in a perfect state, at least in the Cisalpine countries. As regards the first-named style, we have frequent records that painting was extensively applied as an internal decoration, where mosaic-work could not be obtained; and we constantly find notices, during the eleventh and twelfth centuries, of the walls of churches being covered with painted subjects, illustrating the Sacred Writings or the lives of particular saints. * *

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They are formed of small and irregular pieces of stained glass, and in the *ensemble* present no extreme delicacy of execution nor peculiar depth of shadow; the effect being obtained by a rich combination of colours, excellently arranged, and very much in accordance with the scientific principles enunciated by M. Chevreul: the robes are seldom of one plain tint, but are richly worked with ornamental patterns of a bold and effective character. The faces and drapery are seldom strongly marked in shadow; and the former, though in some cases, as in Moses and the king, very finely expressed, yet in others, as in St. Simplicius, are very rudely formed,—a defect, however, not easily remarked at the distance they are placed from the eye, whilst the object which the artist evidently sought, namely, a rich combination of colour, is perfectly obtained. The dark leaden lines with which the small pieces of glass are welded together, without any regard as to where they occur, are also lost in the distance; while the important result is produced by means of these black lines, that much greater solidity and a much stronger effect of colour are obtained. They give increased contrast and distinctness to the separate colours and to the entire composition, which, if not treated in this manner, is apt to become confused and flimsy-looking even at a short distance: indeed, it may be taken as a general

importance attached to the historical subjects, and a very superior style of execution, yet it is not until the time of Perugino that we find a completely different system adopted; and to him appears to be certainly due the introduction of a style in every way superior, which was extended and improved by his contemporaries and pupils, amongst whom Pinturicchio and Raffaelle are most prominent.

I will now bring under your notice the last division of my subject, which is the art of marquetry, or inlay in wood. Although a passage in the treatise of Theophilus on Painting (twelfth century) appears to bear on the practice of working in several kinds of wood,—"cupri, ferri, *lignorum*, lapidumque,"—yet the earliest examples with which we are acquainted are to be found on the ivory boxes, ornamented with inlay of various-coloured wood, chiefly manufactured at Venice during the fourteenth century. In these the art was only employed as an adjunct; and it is not until the close of the fourteenth or the commencement of the fifteenth century that we find it applied as an ornamental art by itself, and developed on large surfaces. Vasari and Lanzi state that Brunelleschi gave lessons in perspective and tarsia, to architects and others, of which Masaccio, in painting, and Benedetto da Maiano, in his inlaid works, availed themselves. Vasari says that several works of the kind were executed by the old masters, "da nostri vecchi," and were termed by them works in "tarsia," or intarsiatura. In his life of Benedetto da Maiano, he states that this practice was first introduced in the time of Brunelleschi and Paolo Uccello, "that, namely, of conjoining woods, tinted of different colours, and representing with these, buildings in perspective, foliage, and various fantasies of different kinds." The earliest artist in this manner mentioned by Vasari, is Giuliano de Maiano (1432—1490), architect and sculptor, who commenced his artistic life with works in *tarsia*, and executed, as his first work, the seats and presses of the sacristy in the Church of the Annunziata at Florence, with Giusto and Minore, two masters of tarsia. * * * *

The moral that may be deduced from these few observations on some out of the many arts associated in the production of the great monuments of Tuscany, is the following:—It has been the great misfortune of architecture, from the last century up to the present time, to be considered as a study *per se*; as an art perfect in itself, and requiring no adventitious aid from the sister arts of sculpture, painting, &c.; but if we search antiquity through, we shall find no example of such a disconnection of the one from the others; and those buildings are the most interesting, the most beautiful and satisfactory, which have sought the aid and guided the aim of all those varied and ingenious methods of ornament, which the skill of mankind has discovered and brought to perfection. It is true that constructive science is of primary importance to the architect; yet it can do no more than form the skeleton which it is his duty to render, not merely useful, but agreeable to the eye; and in order to effect this, he must of necessity call in the aid of the artist in stone, in colour, in metal, in wood and mosaic work, and possess the knowledge and good taste requisite to apply them effectively to his subject: the useful should never be separated from the beautiful: the last is the complement of the first, of which every work of the Divine Creator, the great Architect and Artist of the Universe, affords striking and inimitable proof.

To one deeply penetrated with this feeling, the study of architecture is no longer confined to the few years spent in an office to obtain a knowledge of the different styles, and the usual methods of professional business, but demands long-continued attention to all the arts of design, with a view to their general application to architecture. And here let me say a word on the subject of servile imitation—an evil almost necessarily attendant on the revival of any style or manipulative art. Novelty and beauty excite admiration, and naturally produce imitation: but this will be only for a time; for we should not be human beings if finally we did not endeavour to strike out a new path for ourselves; and then it is that we shall bring to bear our knowledge, not for the purposes of imitation, but of progress. With all just deference to the studies of our predecessors, with all our admiration for the styles of the past, our present object should be to consolidate and arrange the information we now have; and from the lessons thus gained, the examples thus given, strike out a new path for the powers of the architect, and bring back the art to its normal state, which is one of gradual but sure progress, founded on scientific and artistic knowledge: we should perceive that merit exists more or less in all styles, and is irrespective of fashion, which is mutable and often unjust; that the *principles* of our art are fixed and certain; that however much long-received rules may be altered as circumstances may require, they are not to be despised or disregarded without careful consideration; that true construction is the vital principle of real progress; and that, besides the excellent and numerous examples of ornament we already possess, Nature has still varied and inexhaustible resources in store for our study; and above all, that for the appliance of these means at our disposal, an earnest study, a just appreciation, a practical knowledge of *all* art, are indispensably necessary, and can only be obtained by an industrious use of the hand and of the eye, as well as of the mind.

But to what purpose should we do this? What incentive has the architect of this country, and this day, to undergo an education of so protracted and so difficult a nature? Let it be owned at once, that the artist's own improvement, and the development of his own powers, with the personal pleasure consequent thereon, must be the only reward he can reasonably look forward to. Such studies for an architect are "as caviare to the public"—that public which requires builders not artists, and looks with jealousy and distrust on any architect who thinks more of his profession as an art than as a trade. How differently was the architect of the fifteenth and sixteenth centuries in Italy situated! In Tuscany especially, that classic home of art where the old Etruscan spirit, though dormant for centuries, rose from its temporary grave in all the glory and majesty of a bright resurrection, the appreciation and admiration of the public were not confined to one art or to one set of men, but to everything which was calculated to lend a grace and charm to all the requirements of civilized life. The church, the government, the municipality, the noble, the wealthy merchant, delighted to honour all that related to the arts, and the artist might labour

as well as chief of the Ghibellini party in Tuscany, should be raised to his memory. They wrote accordingly to Giotto, requesting him to prepare designs for a very splendid tomb, adorned with whatever might most worthily enrich it, and, sending him the required measurements, they prayed him at the same time to procure them a sculptor, the most excellent, according to his opinion, that could be found in Italy, they referring the whole affair entirely to his judgment. Giotto, who was very obliging, made the design and sent it to them, when the monument was erected accordingly, as will be related in its proper place," *i. e.* in the lives of the selected sculptors, Agostino and Angelo, of Sienna. Here, then, is an instance of what I remarked above, viz. that the greatest artist of the age, whatever his special profession, was looked upon as the greatest designer, and therefore called upon when any work more than usually beautiful in design was required, whether in his peculiar province or not. After this we hear of no more works in sculpture or architecture till we come to the following:—"After completing these works, and on the 9th July, 1334 (*i. e.* if the dates are correct, when he was fifty-eight years old, and only two years before his death), Giotto commenced the campanile of Santa Maria del Fiori. The foundations were laid on massive stones, sunk twenty brachia; he caused the remainder, namely, eight brachia, to be formed of masonry. The bishop of the city, with all the clergy and magistrates, were present at the foundation, of which the first stone was solemnly laid by the bishop himself. The edifice then proceeded on the plan before mentioned, and in the Gothic manner of those times; all the historical representations which were to be the ornaments being designed with great care and diligence by Giotto himself (would that the architects of the present time would do so, and not leave so much work to the carver), who marked out on the model all the compartments where the friezes and sculpture were to be placed, in colours of white, black, and red. The lower circumference of the tower is of 100 brachia (25), that is, one each of the four sides. The height is 144; and if that which Lorenzo di Ghiberti has written be true, as I fully believe it is, Giotto not only made the model of the campanile, but even executed a part of the sculptures and reliefs—those representations in marble, namely, which exhibit the origin of all the arts. Lorenzo also affirms that he saw models in relief from the hands of Giotto, and more particularly those used in these works,—"An assertion that we can easily believe," continues Vasari: "for design and invention are the parents of all the arts, and not of one only. This campanile, according to the design of Giotto, was to have been crowned by a spire, or pyramid, of the height of fifty brachia; but as this was in the old Gothic manner, the modern architects have always advised its omission, the building appearing to them better as it is. For all these works, Giotto was not only made a citizen of Florence, but also received a pension of 100 golden florins yearly—a large sum in those times—from the Commune of Florence. He was also appointed superintendent of the work, which he did not live to see finished, but which was continued after his death by Taddeo Gaddi" (also a painter), so we see now the connection between the shepherd-boy and the Giotto Campanile. Years have gone by—educated by a painter as a painter, and living and practising as a painter, almost exclusively, till he was fifty-eight years old, we now see his powers of drawing, subtlety of composition, his long experience as a designer, his long study of nature, and his matured and full imagination at last concentrated on a work of architecture, as if it was intended to be a lesson for us, that it is not a light thing when we sit down, pencil in hand, to design a work intended to last for centuries; that they are not light acquirements that the art requires; that it is an injury, rather than a benefit, that our knowledge of construction and building is good and that the walls will stand for ages, if, at the same time, our preparation of our powers of design has not been commensurate with the importance of the art, and with our skill in making our work permanent; if, in fact, our art is not worth preserving, for the pleasure, the instruction, and the benefit of succeeding ages. 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Remember all that he became; count the sacred thoughts with which he filled the heart of Italy; ask those who followed him what they learned at his feet; and when you have numbered his labours, and received their testimony, if it seemed to you that God had verily poured out upon this his servant no common nor restrained portion of his spirit, and that he was indeed a king among the children of men, remember also that the legend upon his crown was that of David's:—'I took thee from the sheep-cote, and from following the sheep.'"

As Taddeo Gaddi—born 1300, died 1366—was the successor of Giotto in the superintendence of the works of the campanile, we will next consider a few passages from the life of this master, who was his godson, and who was with him for twenty-four years; "and, after his death," says Vasari, "was considered the first in his art, for judgment, genius, and other artistic qualities, being superior in most of these to all his fellow-disciples." After enumerating many works on painting, we come to this passage:—"Having returned to Florence, Taddeo continued the works of Orson Michelle for the commune of the city, and refounded the columns of the Loggia, for which he used stone, dressed and hewn, instead of the bricks of which they had previously been formed, but without altering the design left by Arnulpho, who had directed that spacious magazines should be prepared above the Loggia, with vaults for storing the reserves of grain laid up by the people and commune of Florence;" and that you may see in how much earnest the authorities and people were in their practice of the art of architecture, as well as the artists, allow me to read the following passage, which I am the more induced to do, as I hailed as a sign of better times the revival to the letter of one of the modes of proceeding here alluded to. Hear Vasari—"And to the end that this work might be completed, the guild of Porta Sta. Maria, to whom the charge of the fabric had been entrusted, commanded that the tolls of the Corn-market, the tax of the Piazza, and other imposts, should be made over to the building; but, what was of more consequence, it was further ordained, and with great judgment, that each of the guilds of Florence should construct a column at its own charges, and should furthermore place a statue of its patron saint in a niche of the same. It was, moreover, decreed that every year, in the festival of each saint, an officer of the respective guilds should make a collection, standing each by his own column, during the whole day, for that purpose, with standard elevated and ensigns displayed." The revival I heard of the other day, when in Oxford, was, that each of the principal heads of colleges and others had contributed a column to the museum. In 1331, he was called upon (Giotto being at Milan) to prepare a model and design for the Ponti Necchco, his instructions being to construct it with all possible beauty, as well as solidity. The bridge of San Trinita was also built by him. "While all these architectural works," says Vasari, "were proceeding, after the designs and under the direction of Taddeo, he did not neglect his paintings"—he painted whole chapels and other works. He died at Milan.*

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There was, however, yet one more charm of great potency at work to aid, and which indeed mainly generated the particular class of excellence to which I propose to draw more special attention. I allude to that particular veneration for technical excellence and honest work which the municipality expressly desired should characterise every work of art for which they gave a commission. Men whose fortunes had been made by the reputation of their skilful weavers, and of their sterling florin,—the only pure gold coin of its time,—could scarcely tolerate, in those magnificent structures which were to be the outward and visible emblem to foreigners of their state, either bad work or dishonest material. Handicraftsmen of all kinds were honoured each in their several degrees: guilds and confraternities were erected with special privileges; and the services of all were enlisted to heighten with every external magnificence the pageants of the community, and the monuments of architecture and its sister arts, which were to be produced for the public enjoyment, and yet more for the public honour. The triumph of the artist was to Florence the triumph of one of its skilful children, whose talent was the manifest source of ease and prosperity to all. Hence the public rejoicings in the "Borgo-Allegro" over the strides made in painting by Cimabue; the public gratulations over the exquisite manipulation of marble work and mosaic by Orcagna, in the Or San Michele, over the brilliant ability of Donatello, Ghiberti, and Luca della Robbia, in sculpture, and over the originality of Giotto, and the daring of Brunelleschi in architecture.

The public buildings in those palmy days of art were looked upon as demanding the co-operation of all; and as each man who brought of his best to the work received, at the hands of his fellow-citizens, both in money and good esteem, the full value of whatever he added to the common stock of beauties, neither the greater men were permitted to appropriate the honours of the less, nor were the less permitted to filch the credit due to the loftier spirits. Hence arose a co-operation among artists and artizans of all kinds such as has been scarcely ever known in the world's history, and hence is derived much of the peculiar excellence and interest of the principal structures time has spared to us upon the almost classic banks of the Arno.

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Amongst all the arts connected with architecture, there is not perhaps one so capable of imparting splendour to a building as that of stained or painted glass; a fact which appears to have been known and practically applied from the earlier period of the Christian era to within the last century or two. In the first recorded examples nothing more appears to have been attempted than filling in windows with a species of mosaic-work of different coloured pieces of stained glass; nor is it until the eleventh or twelfth century of our era that we have satisfactory records

* The following is part of a paper read at the general meeting of the Royal Institute of British Architects, on November 16th, by Mr. J. B. Waring, already referred to.

of the application of figure-subjects in this method of decoration,—a system which reached its apogee, with all the other decorative arts, in the fifteenth and sixteenth centuries. There are three methods of executing these glass pictures, which may be termed the Mosaic, the Enamel, and the Mosaic-Enamel. In the first, the composition is formed of small pieces of stained glass, or glass coloured throughout by metallic oxides, termed pot-metal, welded together in small pieces, and producing all the required tints in local colour: the shadows, which are slight, are produced by the application of enamel colour upon them with a brush, and then fixed by burning in a kiln: the best examples of this class are, perhaps, those of the twelfth and thirteenth centuries. In the second, or Enamel method, which was most in vogue during the sixteenth and seventeenth centuries, the artist painted his subject entirely with enamel colours on a ground of white glass, sometimes on one side only, sometimes on both; the entire design being welded together in pieces of much larger size than those usual in the Mosaic method; and, when complete, fixed by exposure to heat in a kiln. In the third, or Mosaic-Enamel method, we find a combination of both the former: it was the most in vogue, as might naturally be supposed, at a transitional period between the first and second methods, and is, indeed, characteristic of the works of the fifteenth, and of the early part of the sixteenth century. In this method, the use of pot-metal for the large masses of colour imparts all that brilliancy and power which is peculiar to the material; whilst the use of enamel colour for the more delicate portions of the picture, as the flesh, the hair, the ornaments, and the general accessories, permits a delicacy and minuteness of finish otherwise unattainable. * * * *

In the revival of this art during the present century, the artists of France, Italy, Belgium, and Germany have taken the lead, and far surpass any efforts made by the English; yet in the best of these there is much that is unsatisfactory, and neither in drawing, colour, nor solidity, do they bear any comparison with the best works of the fifteenth and sixteenth centuries in Tuscany. This arises principally from an insufficient adoption of pot-metal in the masses of colour, the false idea that the numerous lead lines of the small pieces of glass in the mosaic method are antagonistic to the general effect,—the contrary, I believe, being certainly the case,—the insufficient use of large masses of shadow, and too minute attention to blending the several local colours: such were the defects which struck me in the otherwise beautiful works of Capronnier of Brussels, and of Bertini of Milan, in the Great Exhibition of 1851, and in those of Petit Gerard of Strasburg, of Lafaye, Gérante, and Lusson, of Paris, and of Vincent Larcher of Troyes, in the Paris Exhibition of 1855.

The notices of the magnificent stained-glass windows of the Duomo of Florence are very meagre: some of them are merely stated to have been executed in 1434 by a Florentine artist, Domenico Livi da Gambassi, at Florence, who had learnt the art at Lubeck. This may apply to the series of which an example is given, though that even appears improbable, and some of the subjects in the upper windows of the transepts, of which St. James is an example, are certainly of much earlier date. The entire series is remarkably rich in colour, and consists of the prophets and kings of the Old Testament, and the Apostles and Saints clad in most picturesque and striking costumes, such as Freiligrath describes in his "Pictorial Bible," presenting a fine example of those "storied windows richly dight" which Milton has celebrated in verse.

They are formed of small and irregular pieces of stained glass, and in the *ensemble* present no extreme delicacy of execution nor peculiar depth of shadow; the effect being obtained by a rich combination of colours, excellently arranged, and very much in accordance with the scientific principles enunciated by M. Chevreul: the robes are seldom of one plain tint, but are richly worked with ornamental patterns of a bold and effective character. The faces and drapery are seldom strongly marked in shadow; and the former, though in some cases, as in Moses and the king, very finely expressed, yet in others, as in St. Simplicius, are very rudely formed,—a defect, however, not easily remarked at the distance they are placed from the eye, whilst the object which the artist evidently sought, namely, a rich combination of colour, is perfectly obtained. The dark leaden lines with which the small pieces of glass are welded together, without any regard as to where they occur, are also lost in the distance; while the important result is produced by means of these black lines, that much greater solidity and a much stronger effect of colour are obtained. They give increased contrast and distinctness to the separate colours and to the entire composition, which, if not treated in this manner, is apt to become confused and flimsy-looking even at a short distance: indeed, it may be taken as a general axiom, that the blending of tints, unless in subjects very close to the eye, should be avoided in stained glass as simply labour thrown away.

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Proceeding now to fresco as an ornamental adjunct to architecture, we find that between the Byzantine epoch, when mural decoration could boast of the rich and solemn effect produced by the use of mosaic inlay, and the revival of the art of painting in the fifteenth century, there extends a long period, embracing the works of the Romanesque and Gothic styles, neither of which has been illustrated in the manner they deserve; an omission arising chiefly from the few remains which exist at this day in a perfect state, at least in the Cisalpine countries. As regards the first-named style, we have frequent records that painting was extensively applied as an internal decoration, where mosaic-work could not be obtained; and we constantly find notices, during the eleventh and twelfth centuries, of the walls of churches being covered with painted subjects, illustrating the Sacred Writings or the lives of particular saints. * *

The general characteristics of this Italian Gothic, or Giottesque style of mural decoration are,—a dado, or base, panelled with imitations of various marbles, contained within borders painted in imitation of the glass mosaic-work usually known as Opus Grecanicum, having at times central designs of intricate geometrical and leaf ornament. About 6 feet from the floor is a cornice with small brackets or consoles, all radiating in perspective to a central point of sight: above this the wall is divided into large compartments, containing historical or religious figure subjects, the figures being strongly outlined, and the colours flat and distinct, with but a slight use of chiaro-oscuro. These compartments are also enclosed in painted mosaic borders, and beneath each there is a description of the subject illustrated, written in peculiar Gothic letters of a very good style. The vaulting of the roof springs immediately from above these pictures, the only actual projection being one large central rib, ornamented with winding foliage and mosaic borders, and painted mouldings to carry it more agreeably on to the flat surface of the vaulted compartments, which are almost always painted of a deep blue, studded with gold stars, and in the centre of each of which are painted figures, usually holding written scrolls descriptive of their meaning. Sometimes the names are written on the clouds beneath, from which they frequently appear to rise. The intersection of the rib is marked by a gold boss, carved and gilt, but not of great size, having a ring in the centre, from which a lamp was suspended. The ornament is generally a mixture of mosaic-work, Roman reminiscences, especially in the painted mouldings, and transcripts from nature; the two first, however, being predominant. The colours are well arranged, and the ornamental accessories, such as dresses, buildings, thrones, armours, &c. are of great variety and beauty, and very carefully executed.

Such are the general characteristics of most of the mural decoration in vogue up to the close of the fifteenth century, as seen in the works of Orgagna at Pisa and Volterra, of the Lorenzetti and Bartoli at Siena, and in the several Italian schools of Italy. And although the works of Paolo Uccello, Masaccio, Ghirlandaio, and Signorelli, present many points of divergence, the principal feature being the greater importance attached to the historical subjects, and a very superior style of execution, yet it is not until the time of Perugino that we find a completely different system adopted; and to him appears to be certainly due the introduction of a style in every way superior, which was extended and improved by his contemporaries and pupils, amongst whom Pinturicchio and Raffaelle are most prominent.

I will now bring under your notice the last division of my subject, which is the art of marquetry, or inlay in wood. Although a passage in the treatise of Theophilus on Painting (twelfth century) appears to bear on the practice of working in several kinds of wood,—"cupri, ferri, *lignorum*, lapidumque,"—yet the earliest examples with which we are acquainted are to be found on the ivory boxes, ornamented with inlay of various-coloured wood, chiefly manufactured at Venice during the fourteenth century. In these the art was only employed as an adjunct; and it is not until the close of the fourteenth or the commencement of the fifteenth century that we find it applied as an ornamental art by itself, and developed on large surfaces. Vasari and Lanzi state that Brunelleschi gave lessons in perspective and tarsia, to architects and others, of which Masaccio, in painting, and Benedetto da Maiano, in his inlaid works, availed themselves. Vasari says that several works of the kind were executed by the old masters, "da nostri vecchi," and were termed by them works in "tarsia," or intarsiatura. In his life of Benedetto da Maiano, he states that this practice was first introduced in the time of Brunelleschi and Paolo Uccello, "that, namely, of conjoining woods, tinted of different colours, and representing with these, buildings in perspective, foliage, and various fantasies of different kinds." The earliest artist in this manner mentioned by Vasari, is Giuliano de Maiano (1432—1490), architect and sculptor, who commenced his artistic life with works in *tarsia*, and executed, as his first work, the seats and presses of the sacristy in the Church of the Annunziata at Florence, with Giusto and Minore, two masters of tarsia. * * * *

The moral that may be deduced from these few observations on some out of the many arts associated in the production of the great monuments of Tuscany, is the following:—It has been the great misfortune of architecture, from the last century up to the present time, to be considered as a study *per se*; as an art perfect in itself, and requiring no adventitious aid from the sister arts of sculpture, painting, &c.; but if we search antiquity through, we shall find no example of such a disconnection of the one from the others; and those buildings are the most interesting, the most beautiful and satisfactory, which have sought the aid and guided the aim of all those varied and ingenious methods of ornament, which the skill of mankind has discovered and brought to perfection. It is true that constructive science is of primary importance to the architect; yet it can do no more than form the skeleton which it is his duty to render, not merely useful, but agreeable to the eye; and in order to effect this, he must of necessity call in the aid of the artist in stone, in colour, in metal, in wood and mosaic work, and possess the knowledge and good taste requisite to apply them effectively to his subject: the useful should never be separated from the beautiful: the last is the complement of the first, of which every work of the Divine Creator, the great Architect and Artist of the Universe, affords striking and inimitable proof.

To one deeply penetrated with this feeling, the study of architecture is no longer confined to the few years spent in an office to obtain a knowledge of the different styles, and the usual methods of professional business, but demands long-continued attention to all the arts of design, with a view to their general application to architecture. And here let me say a word on the subject of servile imitation—an evil almost necessarily attendant on the revival of any style or manipulative art. Novelty and beauty excite admiration, and naturally produce imitation: but this will be only for a time; for we should not be human beings if finally we did not endeavour to strike out a new path for ourselves; and then it is that we shall bring to bear our knowledge, not for the purposes of imitation, but of progress. With all just deference to the studies of our predecessors, with all our admiration for the styles of the past, our present object should be to consolidate and arrange the information we now have; and from the lessons thus gained, the examples thus given, strike out a new path for the powers of the architect, and bring back the art to its normal state, which is one of gradual but sure progress, founded on scientific and artistic knowledge: we should perceive that merit exists more or less in all styles, and is irrespective of fashion, which is mutable and often unjust; that the *principles* of our art are fixed and certain; that however much long-received rules may be altered as circumstances may require, they are not to be despised or disregarded without careful consideration; that true construction is the vital principle of real progress; and that, besides the excellent and numerous examples of ornament we already possess, Nature has still varied and inexhaustible resources in store for our study; and above all, that for the appliance of these means at our disposal, an earnest study, a just appreciation, a practical knowledge of *all* art, are indispensably necessary, and can only be obtained by an industrious use of the hand and of the eye, as well as of the mind.

But to what purpose should we do this? What incentive has the architect of this country, and this day, to undergo an education of so protracted and so difficult a nature? Let it be owned at once, that the artist's own improvement, and the development of his own powers, with the personal pleasure consequent thereon, must be the only reward he can reasonably look forward to. Such studies for an architect are "as caviare to the public"—that public which requires builders not artists, and looks with jealousy and distrust on any architect who thinks more of his profession as an art than as a trade. How differently was the architect of the fifteenth and sixteenth centuries in Italy situated! In Tuscany especially, that classic home of art where the old Etruscan spirit, though dormant for centuries, rose from its temporary grave in all the glory and majesty of a bright resurrection, the appreciation and admiration of the public were not confined to one art or to one set of men, but to everything which was calculated to lend a grace and charm to all the requirements of civilized life. The church, the government, the municipality, the noble, the wealthy merchant, delighted to honour all that related to the arts, and the artist might labour

contentedly at his own improvement with the certain assurance that the better he succeeded the wider and deeper his studies were, in that same measure he might count on the applause and appreciation of his fellow citizens. After all, to the generous mind, what reward in money, what payment, however great it may be, for services as a man employed to do a certain work—as a servant, in fact—can compensate for the want of appreciation as an artist? But not for this let us falter or be cast down, the good work must still go on, and though the task be a thankless one, though the seed be cast on a stony and rough soil, yet it is necessary to proceed, trusting that in the future such studies will bear fruit, and be of service to our country.

SOME RECOLLECTIONS OF THE INTRODUCTION OF ILLUSTRATED LITERATURE INTO ENGLAND.

At the end of our former notes on this subject* we alluded to the large increase in the number of artists and engravers caused by the improved means which have from time to time been discovered, of rendering their talents available to the multitude, and have no doubt that movements which are in progress will, to an amazing extent, increase the ranks of the army which is engaged in diffusing knowledge by means of illustrated literature. Without further speculating on the coming wonders, we will glance briefly at the system by which, at the time of the publication of the annuals, and the illustrations by the Findens and others, the numerous book-engravings were produced. In Hogarth's early days he was wont to execute his book-plates with his own hands, carry them when finished to the publisher, receive his money, and then come home, don his sword and better suit, and sally forth to study life; and it is probable that the chief part of the numerous engravings which were produced by this great painter and moralist was the work of his own hands. Woollett, the famous master of landscape engraving, generally had his subject etched on the copper by Browne and other celebrated etchers, reserving for himself the task of working this skilfully laid in neutral tint, by means of the graver and various corrosions or "bitings," into those rich and varied tints which no engraver has equalled.

As the demand for book-plates increased, engravers of eminence began to gather around them assistants and pupils, who, under superintendence, worked according to their peculiar skill on various parts of the plates. At one time the Findens had a staff of about thirty assistants, many of whom were paid high salaries. It cannot be said, however, that this system of manufacturing led to the improvement (in an artistic point of view) of this description of art. At the time to which we refer, the demand for wood engravings was gradually increasing, and the facilities for printing and the quality of them were much improved. There was, however, great difficulty in procuring artists of sufficient skill to make drawings on the wood suitable for the kind of printing then in use; in fact, most of the artists of name would have considered it as an insult had they been asked to make drawings for such a purpose. William Hervey, an apprentice of Bewick's, afterwards a pupil of the unfortunate Haydon's, Kenny Meadows, and occasionally George Cruikshank, by turning their attention to this department of art, greatly improved it in delicacy of finish and brilliancy of effect. Hervey's drawings of animals, engraved by Bankster and others, Kenny Meadows's "Heads of the People" and illustrations of Shakspeare, &c. were a chief means of directing the public attention to the merits and utility of engraving on wood, and most rapidly the taste for books illustrated in this way spread. The school-books, works on natural history, scientific publications, &c. began to be extensively illustrated in a manner which contrasted curiously with the blocks in Catnach style, which were formerly in use, and various serial publications began to be offered to the public; amongst the most remarkable of these were Charles Knight's "Penny Magazine," and the "Saturday Magazine." These works were looked at with wonder at the time of their commencement, both for their cheapness, and as was then thought the merits of the engravings, and truly there were so many difficulties to be overcome by the conductors of those journals, that they are entitled to our best thanks. Amongst these was that of providing blocks of boxwood of sufficient size,—a circumstance to which we have before alluded. In Mr. Knight's illustrated "London," a great step was made, and the writer of this remembers at the commencement of this work, the difficulty there was in getting admission to places in the metropolis, views of which were required for that and other works. Churchwardens and custodians could not readily understand for what those views were needed, and frequently much more time was occupied by formal applications to get access for this purpose than in making the sketch and drawing it on the wood. Many who now enjoy the facilities which are so generally afforded to those engaged on the illustrated press, would feel surprised at the particulars which could be related of the persuasion and patience required in former days.

In thus briefly glancing at salient points in the progress of book illustrations, we must not pass over without notice, the introduction of lithography, which for a time came much into use. The improvements in wood engraving have, however, to a considerable extent superseded this for small works.

Besides the publications just mentioned, and some others of less note, most of our readers will remember the launch of our contemporary, *Punch*, who, with so much wisdom, under a merry mask, has done such good service in many paths. At the time of the commencement of that periodical, various illustrated weekly publications of an immoral tendency, were in the market, and several earnest men joined together for the purpose of providing a source of amusement, which, by refined wit and pure intentions, should, by the contrast, make the dangerous works just mentioned contemptible, and well have they succeeded in their undertaking. The commencement of the *Illustrated London News*, in 1842; the *Builder*, in 1843; and some other works, form a point in the progress of illustrated literature for the multitude; and in the former of these publications, amongst other works, we would mention the large illustrations of the Duke of Wellington's funeral, drawn by John Gilbert, as marvels both of the art of engraving on wood, and surface printing. Thomas Bewick could scarcely have anticipated the extent to which wood-engraving, and rapid and clear printing from wood-blocks, have been carried. We still look for advance. At the present moment the art is standing still. Amongst the various attempts to improve the art of engraving on wood, we must not omit mention of the volumes issued by the Art Union of London, which are illustrated by a number of our best artists, some of whom were thereby led to draw on wood for the first time.

At the present time there are very nearly twenty illustrated papers, which issue weekly from the metropolitan press; and yet the great masses of the people, both in the country and large towns, are scarcely reached.

The art of photography has come largely into use, and by its means we may expect many subjects will be transferred to wood blocks without the aid of a draughtsman. One of the chief obstacles in the way of effecting this at present is the difficulty of finding engravers able to work on other forms than those pencilled by the legitimate draughtsmen, to which they have been so long accustomed. And here we would remark, that, like the steel-plate engravers before mentioned, the engravers on wood who are most largely employed, are getting into the method of producing blocks by means of a large number of organised hands, some of whom cut peculiar tints of the sky and buildings; others, drapery; others, landscape, building, or foliage; and others of greater artistic skill engrave the faces and hands; while the "small boys," or those of little ability, "block out" or cut away the edges and larger spaces which are to print white. No doubt this manufacturing system is necessary where the production of large cuts is required for the illustration of current events; but we fear that it will have the effect of making the artistical engravers capable of executing high-class engravings on wood with their own hands very scarce. One of the evils which will result from the system to which we have alluded will be the loss of the characteristics of the artists' drawings, for the sky man will get into the method of ruling all his skies, in the same way, and the "cutter" of foliage will acquire a conventional style, which will render him careless of copying peculiarities.

It is admitted that increased artistic instruction amongst our engravers on wood is desirable; and it is to be hoped this desideratum will be supplied to the rising generation.

An illustrated paper, published in Paris, has recently given some examples of surface printing, which are well worthy of attention. Some of these subjects consist of figures drawn with much character and energy, and are as they appear before the public, the work of the artist himself, untouched by the engraver on wood. A short time ago a postal district map of London, about 4 feet in length, and of proportionate height, executed by this means, was published at the office of the *Illustrated Times*, at the cost of 2½d. The streets and other places are very distinctly lettered. If this map had been produced on a copper or steel plate, one printer could not have turned off more than fifty or sixty impressions by a day's work. By means of lithography, a few hundreds of copies might have been obtained in the same time; but by the new process between 20,000 and 30,000 copies were thrown off in one night. We are not sufficiently acquainted with this process to be able to give any opinion upon it, but if by this or any other means we could get bold and characteristic sketches by our great artists, produced at such a price and in such numbers, and of such size, as would cause them to be extensively spread about, they would be useful for schools and for the adornment of the dwellings of the poor, and would effect much good.

* See p. 498, *ante*.

CHRISTIAN ART IN PAINTING, SCULPTURE, AND ARCHITECTURE.

One of the most popular, and also one of the most favourably criticised, of living English writers appears to consider that the title of this note applies to "all the productions of art from the time it has been directed and developed by Christian influences;" and that it may be regarded under three different aspects. These seem to be the *artistic*, which is the individual point of view; the *poetical*, which belongs to all (modes of faith?); and the purely *religious* aspect, which belongs to one mode of faith. Mrs. Jameson and her admirers will, it is hoped, not be offended by this slight transposition of her expressions.

The dilemma for that lady's advocates is the following:—

Does the one mode of faith mean the Roman Catholic Church, *semper eadem*, and consequently, formerly as now, heretical in the eyes of Protestants, i. e. Mrs. Jameson and her critics? Or,

Does the one mode of faith mean the Catholic and Apostolic Church, which embraces all those who acknowledge as their symbol the shortest creed, while differing on essential points of doctrine?

If the first position be the truth, what Mrs. Jameson calls Christian art would be quite as much represented by the works of Battoni and Canova as by those of Nicolo Pisano and Fra Angelico. That of course will be repudiated in favour of the second position. But, although the second position is preferable, because it opens the door of Christian art for the admission of the later Byzantine works, it also opens the door to those very works of Battoni and Canova, which that lady and her followers most assuredly repudiate; and would also force them to admit the animated later works by Sir Charles Eastlake, and the landscapes by our best painters, into the ranks of Christian art. There is only one way of escape from this dilemma; and it has practically led Mrs. Jameson to ban the churches above named, and to say pretty clearly that Christian art is the reflection of the literature of the sixth to the tenth centuries, which literature was "the Legends of the Saints," and, as Mrs. Jameson says, was taken up at a time when "the reverence for those who endured martyrdom gradually grew into veneration, worship, adoration; a line too fine and invisible not to be transgressed by excited popular feeling." But those who are not content to hear that Christian art is only to be found in pictures drawn from the Legends of the Saints may oppose that purely Roman Catholic restriction; and, after first suggesting to Mrs. Jameson that it does not seem to be the province of Christian art to tempt an excitable popular feeling to a breach of the first commandments, may say that they are yet waiting for a reason why any of the following classes should or should not be considered alone or with others as Christian art. These are,—

1. Ornamentation (by diaper or geometric patterns, painted or sculptured, or both), in which it is assumed that no resemblance to any previously existing thing occurs.

2. Ornamentation in which monograms, emblems, &c. (invented or appropriated by the Greek or by the Roman Catholic priesthood before the present time) constitute the chief features.

3. Representations of subjects from the Old Testament; or from the New Testament; or of the Innocents, Saints, and Martyrs commemorated by the Church of England as by law established; or of persons canonized by the Popes; or of such subjects as the Day of Judgment, Paradise, &c.; or of personages of any class not engaged in miracles or martyrdoms.

And, finally, for the proof of the religious condition of the painter, the sculptor, or the architect, at the time of his conception and execution of the work, because, of course, a practically irreligious man, or a heretic, could not produce a work of Christian art: indeed, it is doubtful whether any, unless engaged in the sacerdotal profession, could be successful.

This is the most tender point in the discussion. Either we must accept all the works by any persons professing to be Christians, as Christian art; or we must ask Mrs. Jameson and her friends to draw up an authoritative list of the pictures, sculptures, and buildings that were conceived and executed under the influence of inspiration, and nothing less than such inspiration will be requisite to those who draw up such a list: in fact, the writers of it must be infallible guides. So conscious, indeed, is Lord Lindsay of this, that he endeavours to obviate the difficulty in a most ingenious and unsuccessful manner: he says of those who, with him, practise and admire Christian

art, "it is not symmetry of form or beauty of colouring, apart or conjoined, that constitutes our prerogative, but the conception by the artist, and expression to the spectator, of the highest and holiest spiritual truths and emotions,"—*e. g.* landscape is not Christian art,—and, indeed, as the prerogative of Christian art half depends upon the spectator, there would be no work that was really Christian art unless there was a spectator to recognise in it the expression of these truths and emotions. Now, if Lord Lindsay was not writing nonsense, will he, or any one for him, acquaint the public with those canons of criticism which inform him and his disciples when the highest and holiest spiritual truths and emotions are conceived by the artist and expressed in painting, sculpture, and architecture to the spectator? Of course, no one will attempt such a defence of the passage just quoted, because it involves a statement of two things; first, a list of the truths that are to be considered the highest and holiest spiritual truths; and secondly, a list of the emotions that are to be considered the highest and holiest spiritual emotions. Nothing less than the conception and expression of these being Christian art, it would seem that the books produced by the two distinguished writers whom we have cited are mis-named, and that they should have been entitled "Collections of the chief instances of pictures pretending to be works of Christian art, but falling short of that rank." At the same time, will any person who uses the words "Christian art" be so obliging as to explain, by any process of reasoning, whether Dante's vision is a work of Christian art or not, and to give an answer to the same question in regard of Milton's Paradises? It is a great comfort that, in theory at least, Lord Lindsay seems to differ from Mrs. Jameson, and that he would allow the possibility of Sir Charles Eastlake's later pictures to be as true works of Christian art as the best productions that imitate the Madonna di S. Luca; and that he would do equal justice to such pictures as "The Governess" and "The Needlewoman," provided always that the spectator be truly a Christian, because, of course, Mrs. Jameson and Lord Lindsay must be assumed to be capable of comprehending the expressions above named, even when unsuccessfully put before other critics.

But the matter gets much more simple when we approach the subject of Christian art in architecture. Here we have a list of negations. It will probably be conceded by those who use the term Christian architecture that it does not mean any particular style at all, provided that the building fulfils an intention of conveying to the spectator (being a Christian) the expression of the highest and holiest truths and emotions; that any style which fails to produce such a building, when required, does not belong to Christian art; that the architects since 1500 have signally failed according to their critics and their own admissions, in producing such a building in any style; that Christian art does not include any style, and that Christian architecture does not include any building, merely because the style and the building are used for an edifice which is called a church; that the mere fact of a style arising, if it were possible, amongst a people professedly Christian, would not make that style Christian art; and that Christian architecture does not mean the style or succession of styles practised from the sixth to the sixteenth centuries for Christian purposes.

And, what is still more to the purpose, we should have some assertions—that the highest and holiest spiritual truths and emotions are only to be exhibited in one style in architecture, though in many styles in painting and sculpture; that this style is still Christian art, even when applied to secular objects, although painting and sculpture when applied to secular subjects cease to be Christian art; that this style is any one form, or all the forms, of Pointed architecture which were practised in the Christian parts of France, Spain, Italy, and Germany, in the sense of Northern Europe, and in England and the Low Countries during the period 1200-1500; and that this style, or these styles, if practised elsewhere, were not Christian architecture. Besides all which, we should have the startling, but somehow to be explained some day, corollary, that during those ages, and especially during a particular half-century, the Roman Catholic priesthood (considered heretical by Protestants) possessed while present in these localities, but lost on removal, the power joined to the will of making their buildings then and in future express those highest and holiest truths and emotions which are essential for art or architecture to be Christian art or architecture. With every respect for present architects, we beg their attention to their condition as it may be inferred from the words of (an English Protestant clergyman) the Rev. Thomas Hugo, M.A.:—"The forms of Gothic architecture are those in which men of old expressed their holiest, deepest, sublimest thoughts" (perhaps Mr. Hugo has slightly exaggerated; and we omit the next passage, which occurs in the *Builder* of this year, 1857, page 77); "these men possessed and venerated the faith, and they wrote it in every detail of the buildings which they reared as that faith's material abode;" a faith which, as above shown, was uniformly in certain places, at a certain time, and in certain hands, sure to produce a work of Christian architecture, whether or not (and this line should have the particular attention of Mr. G. G. Scott) the practitioners or architects had large means, and had ever learnt the grammar—if indeed one existed—of their art.

ANON.

HERALDRY IN ARCHITECTURE.

HERALDRY claims a long and very ancient connection with architecture. All nations who have made different arts minister to the decoration of their dwellings and public edifices have used it as an accessory. By it is indicated the rank or station of the proprietor or the designer of them: as an historical record, as a souvenir of the dead, and as conveying information of the manners of different countries, heraldry is a useful science; but it has not always been judiciously employed as a means of decoration; sometimes it has interfered with and marred the effect of lines and members of importance in buildings. It ought always to be made subordinate to the principles of art.

Heraldic ornaments sculptured on the temples of antiquity arose from the common habit of dedicating the armour of the enemy and suspending it in temples. This is alluded to by the Greek poets. The Iliad (vii. 81) describes the victor as bearing the armour he had won to Troy, and hanging it up in the temple of Apollo; and Virgil describes, in Eneid (vii.), a temple hung round with—

> "Helmets, darts, and spears,
> And captive chariots, axes, shields, and bars,
> And broken beaks of ships, the trophies of their war."
> *Dryden.*

The shield of Agamemnon and the shield of Achilles, to fall by which was considered, in those heroic times, as the greatest calamity; the quantity of military ensigns borne by the Greek cavalry; the rich banners and standards, were objects too magnificent not to be represented by their best sculptors on the friezes of their temples. From the times of the Greeks and Romans, though we might add to these the Persians and other nations, the sculptured stone and the emblazoned shield have been generally applied as architectural decorations to civil and religious edifices.

Adulation or vanity, and not a love of art, has sometimes been the cause of overloading a building with heraldic bearings. Some monuments in Italy exhibit this fault to such a degree that, as a French writer says, they might be taken for archives of heraldry. The Duomo of Orvieto is, perhaps, one of the most remarkable instances of the extent to which the passion for decoration, and the excessive love of colour, may be carried. Its whole surface was covered with subjects from the Old and New Testament. Many *façades* presented the sculptured effigies of the holy protectors of the city, of the benefactors of the church, of the architects who had designed them; and the Duomo of Sienna was decorated with the armorial bearings of all the cities federated with that illustrious republic. If our memory serves us, the Uffizii of Florence had a collection of arms painted in compartments, underneath its cornice, in the *façade* facing the Piazza.

Armorial bearings were first brought into England by the Normans at the time of the Conquest. The number of *armouries* received a considerable augmentation from the splitting and subdividing of landed property, and were still further multiplied by those used in tilts and tournaments* In the ages immediately subsequent to the Crusades, the symbols of heraldry began to be prominent features in architectural works. The shields upon which they were first represented were in the form of an isosceles triangle, slightly curved on its two equal sides; but soon afterwards they began to assume that of the Gothic arch reversed, a shape probably adopted with a view to such decoration, as harmonizing better with the great characteristics of the pointed style. Painted glass, too—that powerful auxiliary to architecture, which invested the interior with tints of such enchanting splendour; which diffused such life and glory around by the reflection and refraction of light,—painted glass, in its earliest application, was employed to represent military portraits, and arms with scrolls containing short sentences, from which family mottoes may have originated.† Warton places this gorgeous ornament at an era earlier than the reign of Edward II. Encaustic tiles, also, which were introduced in the early days of heraldry, afforded another means of displaying the insignia of warriors. They are still found in the pavements of many of our cathedrals and five old parish churches. The ornaments burnt into them are of infinite diversity. The zodiacal signs sometimes appear as an ornament on pavements, as they were also sculptured on the doorways of several cathedrals. Leaves entwining among escutcheons were common; and animals that denoted strength, courage, sagacity. Among fish, the dolphin, which is considered by heralds the chief of fish, and assumes a relation to naval affairs more than any other fish, is found frequently depicted in heraldic bearings:* it is so distinguished on account of the beauty of its form and its successful adaptation in numerous examples of sculpture and fountain decoration. We find, in many of our cathedrals, shields of various sizes placed on the point of their arches in a succession of square compartments sculptured in the stone, sometimes painted and sometimes not; inserted in the spandrils; on the bosses of vaulting; and of several different dates, so that they give a clue to ascertaining the periods of various portions of the architecture. The notices that Willement (the heraldic artist) gives, of heraldry in different cathedrals, are interesting to the student.†

We see that the masons and carvers of the Middle Ages, in addition to the great quantity of symbolical figures which they wrought out of their fertile fancies,—

> "Aussitôt main fécond en réveries
> Inventa le blazon, et l'art des armoiries"
> (*Dépreaux*)—

availed themselves freely of the stores of heraldry which the pomp of power, the spirit of rivalry, the love of distinction, and the ostentation of wealth had rendered very considerable; for every baron or prince had his arms; every county, city, borough, and town corporate and guild had its arms; every abbey, monastery, college, and school, founded in England and Wales, had its arms. The reigns of Edward III. and Richard II. were the "palmy days of heraldry." Hereditary arms were perhaps scarcely used by private families before the beginning of the thirteenth century.‡

Quatremère de Quincy says on this subject (*Dictionnaire*, art. *Armes et Armoiries*), that heraldry which, after all, is only an *accessary*, often plays too *principal* a part; doors sometimes seem as if they had been made expressly to support a mass of these grotesque ornaments,—ridiculous trophies raised by bad taste to vanity. They are not inherent to architecture, though sculptured in the stone: they should be treated as a *hors-d'œuvre*, and never break the uniformity of a building; whereas we often see in some of the grander buildings in Europe pediments and raking mouldings broken up, and an aperture left in the middle purposely to admit a bust, a medallion, or an armorial bearing. Whatever beauty the ornaments and details we have been speaking about possess in themselves, they should increase our admiration for the higher and superior beauty of the object they adorn: *that* should be the great centre of attraction. Where good taste presides they may be most advantageous, and contribute greatly to the effect of a building, though not essential parts.

F. L.

* Edmundson's "Complete Body of Heraldry."

† "The Curiosities of Heraldry," by O. A. Lower.

* Moule's "Heraldry of Fish."

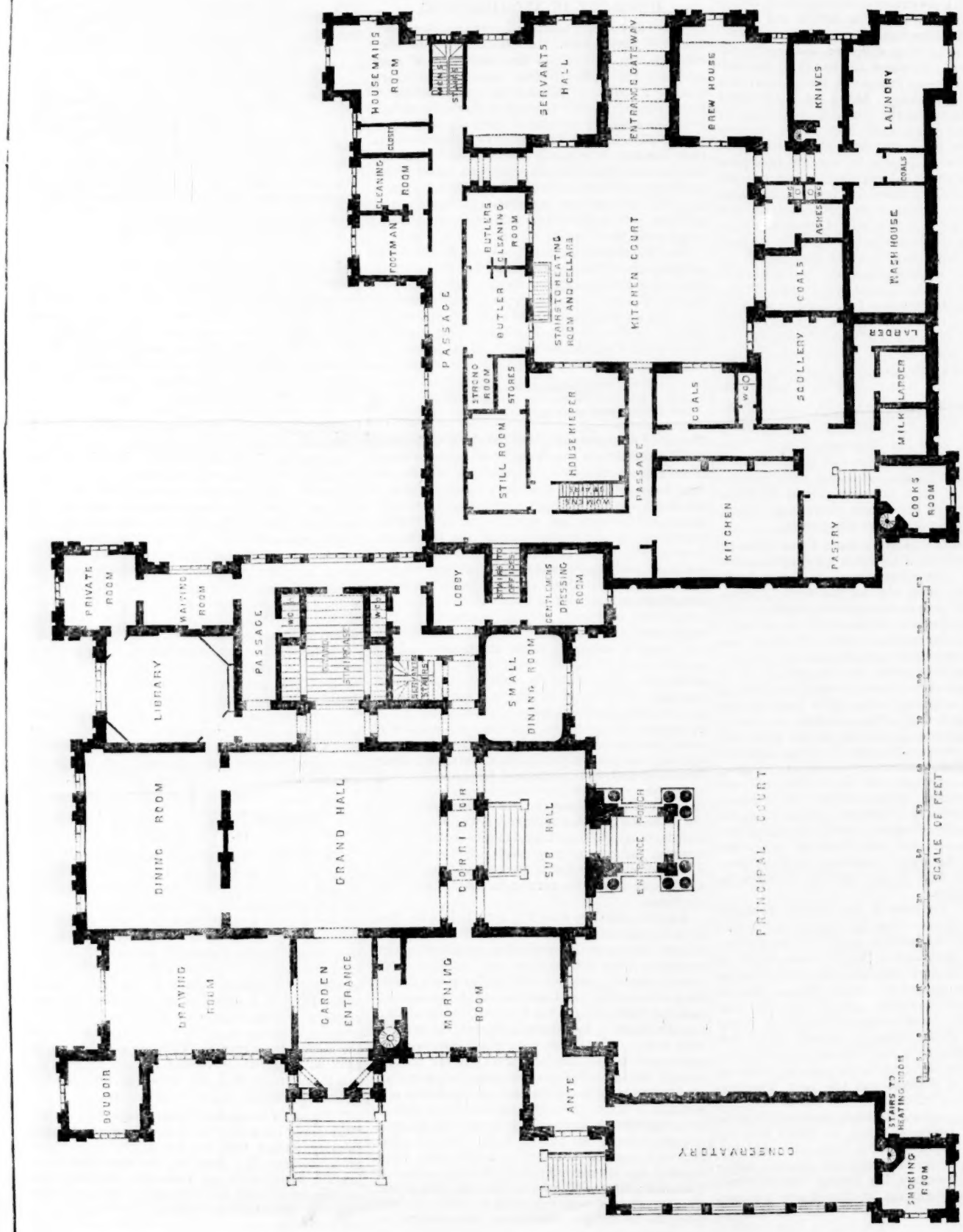
† "Heraldic Notices of Canterbury Cathedral."

‡ Hallam's "History of Europe during the Middle Ages."

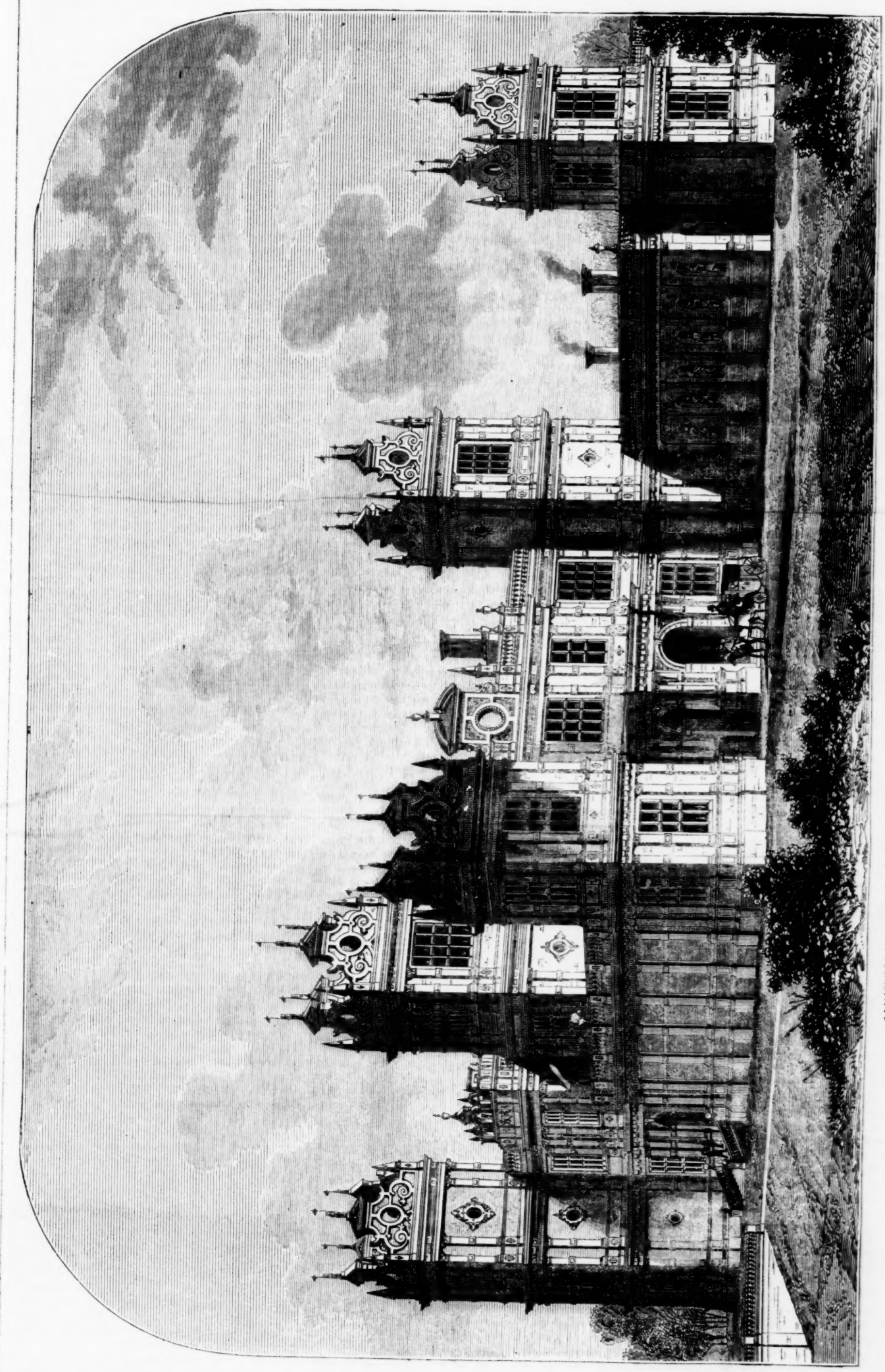
CONSTRUCTION OF FLUES AND VENTILATION.

MR. GEORGE JENNINGS, to whose ingenuity and spirit we owe many useful things, now in great demand, has lately patented some fresh matters relating to construction and ventilation. He proposes to employ a light iron trimmer in front of chimney openings, instead of the wood trimmer now used; also, hearth blocks, perforated, instead of the half-brick trimmer arch,—the perforations in the "blocks" to correspond with air spaces in the iron trimmer joist. He then, in combination with these matters, proposes to use earthenware flue-pipes, having air spaces or chambers round them, so shaped as to make the circle into a square. These air chambers are to serve as extractors of vitiated air, and are so made that they bond in with the brickwork, and take the inclinations peculiar to flues in buildings.

"Suppose a two-roomed house," says the patentee "the lower room only having a fire-place, but the chimney formed with my flue pipes, if the upper room, wanting the fire-place, be connected by a junction block, with my extraction chambers, the sleeping-room would be continually changing the air. Of course, I have also a simple plan for supplying air for respiration, and to support combustion." In a larger house, the kitchen chimney only being built with the flue pipes, and the extraction chambers communicating with every room, at or near the ceiling line, vitiated air, from the heat imparted from the smoke flue, would be drawn off without any communication with the interior of the smoke flue, as is the case with the Arnott ventilator. We must take an opportunity to look at these arrangements.



MENTMORE, BUCKS: GROUND PLAN.



MENTMORE, BUCKS.—SIR JOSEPH PAXTON, M.P. AND MR. GEO. HENRY STOKES, ARCHITECTS.

MENTMORE, BUCKS,

THE SEAT OF BARON M. A. DE ROTHSCHILD.

MENTMORE, of which we this week give a ground plan and view, is the seat of Baron Meyer Amschel de Rothschild, lately erected from the designs of Sir Joseph Paxton, M.P. and Mr. George Henry Stokes.

It is about 1½ mile west of the Cheddington station on the London and North-Western Railway, and is situated on an eminence which commands a fine view of the vale of Aylesbury, the Dunstable downs, and the Chiltern and Barham hills.

The style adopted by desire of the baron for the exterior is that which prevailed during the early part of the reign of James I. and of which Wollaton Hall, Notts, is perhaps the finest example. A difference in the combination and arrangement has contributed to produce grouping of a picturesque character and outline, and the details and ornamentation are understood to be the result of a careful study and examination of the works of John of Padua.

The mansion is built entirely of Ancaster stone, of fine quality and colour: the cornices are highly enriched; and the frieze of each order is filled in with carved panels and heads.

The approach to the mansion is by a court, flanked on one side by the wall of the conservatory, and on the other side by the screen wall of the servants' offices. Niches are formed in each of these walls, for the reception of statues. The entrance-porch is of sufficient width to admit of carriages passing through, and has a groined stone-ceiling elaborately carved. From the sub-hall, which is lined with Caen stone, and paved with Sicilian and Rouge Royal marbles, a flight of marble steps leads to the arched corridor, which forms means of communication between the suite of apartments on the ground-floor and offices. The grand hall is about 48 feet by 40 feet, and 40 feet high, and is separated from the sub-hall by the corridor just mentioned. At this end of the hall are inserted three arches, the whole height of the ground-floor, filled with polished plate-glass. The entrance to the interior is through the centre arch which forms a doorway.

At the level of the chamber-floor the grand hall is surrounded by corridors, and an open arcade of great beauty and richness; each arch of which is filled with a balustrade of alabaster and green marble. This arcade, with its richly-moulded arches, carving, and ornaments, is striking and effective, and imparts both character and variety to the interior.

Immediately above the arcade is the main cornice, from which spring the coved ceiling and walnut ribs, which divide it into compartments; stone heads, carved by Monti, are placed in the frieze beneath each rib, and the compartments of the coved ceiling are filled with ornamental shields, scrolls, and foliage.

The hall is lighted from the top, the roof being constructed externally on the ridge and furrow principle. This ridge and furrow roof is supported in wrought-iron riveted girders, to which also is fixed the framework of the ceiling, consisting of moulded walnut ribs, filled in with glass manufactured expressly for the purpose.

The grand staircase occupies the side of the hall opposite to the vestibule of the garden-entrance, and consists of one wide central flight of steps of solid Sicilian marble: on either side of which is a deeply-recessed arch with coffered ceiling; a flight of steps on each side leads from the landing to the corridor, surrounding the grand hall. The ceiling is divided into panels by moulded walnut ribs, the soffits of which are enriched with guilloche ornament.

Some departure has been made from the style of the exterior, in the decoration of the principal apartments, the dining-room, drawing-room, &c. being elaborately finished, and decorated according to the styles which prevailed in France during the reigns of Francis I. and Louis XIV., XV. and XVI.

The servants' offices are also built of Ancaster stone, and are in the same style as the mansion. They form four sides of a quadrangle, the entrance to which is through an arched gateway. The whole of the rooms are fitted with every requisite. The kitchen, pantry, and larder are lighted from the roof. The kitchen is provided with all necessary appurtenances, which were supplied and fitted by Messrs. Temple and Reynolds, Princes-street, Cavendish-square. Direct communication is obtained with the mansion by steps leading from the passage near the kitchen; the kitchen, scullery, and other rooms appertaining to it, being thus placed in a nearly central position.

The mansion is warmed throughout by hot-water pipes, and provision is made for ventilating each room, by the admission of fresh, and the removal of vitiated air. The whole of the windows are fitted with copper casements, and glazed with plate-glass, supplied by Mr. Alfred Goslett, of Soho-square. The hot-water apparatus and bell-hanging were executed by Mr. May, engineer, Dean-street, Holborn.

The contractor for the works was Mr. George Myers, of Lambeth, by whom the whole has been executed in a most excellent and substantial manner, under the able superintendence of Mr. John Jones, the clerk of works.

POINTED ARCHITECTURE AND ITS GREATEST ENEMIES.

SIR,—It may be convenient for some people to sneer against anonymous criticism, and it is most proper to reprehend it if it be made the vehicle of personal attacks; but in matters of scientific or æsthetic investigation, where there is, or ought to be, but one object in view—the search of truth—it is both desirable and convenient to conduct the discussion without mentioning names on either side. In the examination of dogmas and theories it is often proper and necessary to use strong language. It is by rough shaking only that gold is separated from mud. Truth is truth, whether the discussion lie between Mr. X. and Mr. Z. or between Cato and Poplicola. But in the former case every keen observation is felt as a personal reflection. Mr. X. takes the strong language as aimed at himself, not at his theory; and Mr. Z. fancies there is always some lurking shaft aimed at his own defects or misfortunes. It is from these causes the rules of Parliamentary debate prohibit the mention of any member's name, and that you, sir, and every conductor of any leading public journal, make use of the editorial *we*, instead of the egotistical *I*. It is found more convenient and more courteous. It leads more directly to our argument, and we are less liable to fall into personalities.

But if gentlemen who have placed themselves at the head of a party are determined to make a personal matter of it, and *will* rush into the conflict, catching up every skull-cap they find, and, putting it on their own heads, cry out,—"What a wretch this is who has made this for me!" all that can be said is this—if they will fit on the cap, they must take the chances of the blows that may light on it. But why should anything of this sort occur in matters of abstract taste or art? If Mr. Scott chooses to rush into a controversy as to Pointed architecture, why should he thrust himself forward as bearing the sins of the whole of a small, but very noisy and arrogant body? Months have elapsed since the lectures to which he alludes were delivered, and their sentiments have since been extensively quoted, bandied about, and perhaps exaggerated. Still the question is not whether A. or B. utter them, but whether they *are* enunciated publicly. Jack Wilkes assured George the Third that "he never was a Wilkesite," and it is no doubt true there are "Scoti ipsis Scotis Scotiores;" but why should he apparently be so eager to seek a personal antagonist? "I think I know 'Verax,'" he says. What of that? Would truth be less truth, if he does; or if "Verax" could be put down by casuistry, or silenced by clamour, would not truth eventually prevail? It is generally the sign of a weak cause when a man evidently tries to pick a personal quarrel with its advocates. There is an old stock joke at the bar, that a brief was once delivered containing these words:—"We have no case; counsel are instructed to abuse plaintiff's attorney." And very pretty insinuations (we will not say abuse) there are against "Verax;" garbled, distorted quotations, seeming erudition (on which point, by the way, we may respectfully take leave to demur to the self-constituted tribunal), and, worse than all, some more than insinuations as to veracity. Let us enter into these points, and see what "Verax" has said, and whether or no Mr. Scott may not a little, a very little, have laid himself open to similar imputations.

But, before we begin, we must try and set Mr. Scott right as to quotations in inverted commas. These are not supposed to be *verbatim et literatim* transcripts of *all* a writer has said. Should we attempt this in Mr. Scott's case—should we have to give all his three-or-four-ways-to-be-understood sentences, we should have enough to do. Inverted commas mean that the phrases included are not those of the writer. It does not follow that they contain every letter and syllable quoted, but that they honestly contain the pith and sense, or salient points of what has been said, or likely to be said, by others. Any garbling or distortion is clearly wrong. But to write "in inverted commas" "Crusader" for "*Soldiers of the Cross*" (and, mind, this is italicised as one of "Verax's" heinous offences) is certainly not a garbling of a quotation, the more especially as the greater part of those worthies were soldiers of anything else but the Cross.

Well, let us quietly, and as shortly as we can, run through "Verax's" statements, and the replies to them, and let us see how far these answers are those of an open, candid, and generous mind, or not; or whether the same or worse objections may not be retorted on the objector.

"Verax" commences by stating that the title Christian architecture, *par excellence*, is not due to the Pointed style, in several respects. It never existed in the heart and centre of the Christianity of the period, and was not the architecture of the early Christians, nor of the Primitive Church for many centuries. Now, what is Mr. Scott's answer to this? "A style often objected to as Popish is stated not to be Christian, because not found at Rome." This is *all* he has to say. Is this attempt at a sneer either a fair representation of the argument, or any answer to it? Permit me for a moment to state it in the words of the Roman antiquaries. "Here," they say, "are the buildings wherein, if not the holy Apostles themselves, certainly their immediate successors, have met and worshipped,—buildings hallowed by the footsteps of saints, and the blood of martyrs, where the great champions of the faith, the fathers and doctors of the church, have maintained the sacred truths of Christianity,—buildings which are, doubtless, the spots on earth most to be reverenced, except Jerusalem itself, by any Christian of whatever persuasion,—and you brand them with the odious title of Pagan. You might as well say the New Testament was heathen, because it is written in the heathen Greek tongue. And then you cite your northern Gothic, which is nothing but Saracenic brought over by the Crusaders, and tramontanized, and vow that is the only Christian architecture, and for no reason, or no ground, but your bare assertion." Instead of sneering at "Verax," will Mr. Scott be so kind as to answer the Italians? I can assure him the expression Pagan, as applied to their buildings, is regarded by them with horror, as the reckless application of an opprobrious term to some of the most sacred places on earth.

"Verax" next goes on to plead that Pointed art can scarcely be called Christian *par excellence*, as the Church had existed twelve centuries before such art was known; that it no sooner took root and got to maturity than it showed symptoms of decay; that it occupied only one-twenty-sixth portion of the existence of Christianity while in its glory, and only one-sixth in all its stages, including its debasement. He goes on to show that the world was not in that state of Christian excellence as to stamp such character on co-existent art; that the Church was in a frightful state of schism, dissension, and corruption; and that of the laity as bad; the Eastern empire at the mercy of the Turks; neither learning, arts, nor commerce; the lower orders slaves; no law but the will of the strong; no arbitrator but the sword. To all these arguments what is the reply? Absolutely nothing. But Mr. Scott, who, evidently finding "he has no case," wishes to get his fling at the opposite advocate, cries out,—"There now! what a shame! He says there were no arts! Why, there were three painters just beginning to learn at Florence from some Greek artists; men built lots of cathedrals [not a quarter so many as the Normans]. Can you say the days of Grostête, Abelard, and Dante, were not days of learning, and of the German free cities and Italian towns those of commerce?" Soft and fair! *Exceptio probat regulam.* Isolated instances will not prove general principles, but rather infer the reverse. If a few learned men could be found in a century, it would not prove that the majority—a very large majority—were not in gross darkness. The old alchymical Bishop of Lincoln (Grostête) had amassed some learning when the rest of the world had none, and people wondered at him; as to the other school-man, he would have been forgotten ages ago if it had not been for his unfortunate and scandalous amours. Are these men to be quoted as proofs of ages of learning? The days of Dante were what he describes them himself, days of darkness, ignorance, fraud, and oppression. He was a bright, particular star in his age; a great and glorious poet; and had acquired so much learning that we wonder where he got it. But there are hundreds of fifth-form boys, and thousands of undergraduates, who possess more learning than the whole world had in that age. As to the painters, they were fathers of a school which ultimately arrived at the highest perfection, but they stood alone in their day. The same thing may be said as to commerce; the Hanseatic league was just formed, which ultimately ripened to most important results; the citizens of Amalfi had a large coasting trade in the Mediterranean, which, centuries after, led to the maritime enterprise that discovered America, and to that enormous state of trade we now call commerce. All these things must be taken comparatively. I suppose more tonnage goes out from the port of Newcastle now, than existed in the whole world in that day.

Just let us push this sort of argument one step farther, and see to what absurdities it may lead. Flavio Gioia, or (as Dr. Gilbert thinks) Paolo Veneto, brought a mariner's compass from China, in 1260—*ergo*, it was the age of magnetic science,—and it may be believed that Cœur de Lion sent home the news of the storming of Acre by electric telegraphs (I beg their pardon), telegrams! Bartholomew Schwartz, somewhat later, found out how to use powder as a

projectile—*ergo*, it was the age of gunnery,—and it is not impossible Philip Augustus used the Minié rifle!

No, sir, attempts have been made to show these were ages of faith, because people believed whatever they were told—for the best of all reasons, they had no power to examine; and ages of happiness, though the world was full of violence. But to endeavour to go further has been reserved for the present day. I fear we must sum the matter up in the words of a lively French writer, who says,—"In those times there was no science, not even in that which touches us all most nearly—our health. The king's physician was invariably a Jew or an Arabian; the king's fool was always a native."

On the next point, I find "Verax" is accused of having made sad mis-statements: he has said "the last new original style," "the last modern architecture," instead of "the latest original style of architecture," and "the architecture of the modern as distinguished from the ancient world:" he has also stated that the very same thing is called by the same writer "Mediæval;" and "the architecture of our forefathers" *in the next paragraph*, when, in strict truth, it is only *in the next page*. All sorts of hints are thrown out to lead people to believe that much turns on all this, and that "Verax" is perverting quotations and mis-stating facts. Can anything be more petty, more ungenerous? It would have been much better if Mr. Scott had answered "Verax's" question, how its being the last new style—I beg a thousand pardons, "the last new original style"—made it, *par excellence*, Christian. A newer style, then, it seems would depose it from its virtue and dignities. But "Verax" denies it is the last new original style of architecture: this he asserts to be that of iron and glass; and that the Italian (as much derived from the Roman as the Decorated from the Lancet) was another original intermediate style.

But now comes a really serious accusation of "a double mis-statement;" here are the words: "On the much-vexed question whether the Pointed arch was imported by the Crusaders from the East, he ('Verax') first converts it into a question whether Pointed *architecture*, instead of merely the *arch*, was so imported." This "Verax" does *not* do, for he does not see how they are to be separated: the other half of "the double mis-statement" is, that "Verax" makes out Mr. Scott *admitted* this, by purposely leaving out an *if* in transcribing the passage. In many instances there is much virtue in an *if*,—but in this there seems to be none. These are his very words,—I hope by an error of the press or transcriber these letters may not again fall out:—'If its [the Pointed arch's] systematic adoption can with certainty be traced to the suggestive architecture of the East, surely this does not unchristianize the already Christian architecture of the Soldiers of the Cross, who brought the idea home among the spoils won from their unbelieving foes." In the name of "conscience," as Mr. Scott talks so much of it, what is this but an admission,—ay, and that in spite of the *if* that he is so extravagantly anxious for? "*If* I did so and so, I did it with a good motive." Is not this an admission that something *was* done? "*If* I brought home the statue, I did not break the finger off." Is not this an admission of a fact? "If the Crusaders brought home something, they did not unchristianize it." Is not that an admission something was brought? But, probably Mr. Scott thinks he can blow hot and cold, and, if foiled in one part of his argument, can jump round his *if*, and take up a new position. This will not serve; there cannot be two truthful defences. It will not do for a thief to say, "I did not steal the horse, but *if* I did, I meant to send it back next day." His *if* would be considered an admission of the fact before any "conscientious" magistrate, and would infallibly send him to the sessions. It comes to this, the Crusaders brought something home or they did not. If they brought nothing home, what nonsense it is to talk of what happened to it by the way. The Americans are very fond of small jokes about *nothing*: "half nothing," "the small end of nothing whittled down;" but of all strange ideas the strangest would be to "unchristianize" nothing. If they brought *something*, what was it they brought? The passage under examination is certainly as obscure and involved as anything I ever read, and is probably intended not to be too closely scrutinized: if so, Mr. Scott has brought it on himself,—he forces us to try and unravel it.

But, before doing this, it will save time and smooth the way to have a word or two about Mr. Fergusson's book. Mr. Scott says it would not be easy to look through all he has written; it seems, however, he has gone as far back as 1849. His conclusion is, that the search does not help "Verax." Let us see what, in "Verax's" own words, Mr. Fergusson "shows."

And here it is really a relief to take up a book based on facts and dates. It would be well if every architectural critic wrote like Mr. Fergusson, as careful and as candid in speaking of a Hindu Vimana as of a Roman Basilica,—as unprejudiced in treating of the Parthenon as of Salisbury Cathedral,—and pursuing the only philosophical way to arrive at truth by collecting all his facts before he begins to deduce inferences. Now let us turn to page 383, *et seq.*:—Your readers will perhaps remember the year of the Hejra was 622, and that of the first Crusade 1096. Well, what does Mr. Fergusson show of undoubted Moslem or Saracenic architecture? The mosque of Caliph Omar, at Jerusalem, was built A.D. 637; the mosque of Amrou, at Cairo, 642; the mosque of El Aksah, at Jerusalem, 691; the mosque of Caliph Walid, at Damascus, 705; the mosque of Ebn Touloun, at Cairo, 876; the mosque of El Azhar, at Cairo, 981; the mosque of Sultan Barkook, at Cairo, 1149; several others, also, of later date. Of these he gives five very clever illustrations; and I am sure, to any unprejudiced mind, a few glances will show these to be the models or precursors of our Pointed architecture.

But let any one go through his book, and after that look to any other work wherein views of Moslem architecture are contained, and there cannot be a doubt of the resemblance. I remember once standing before the magnificent west front of Peterborough Cathedral in company with an [illegible] when he said, "Why, this is [illegible] throughout the East: huge poin[illegible] up to the top of the building; spire[illegible] thing like the minarets—the as[illegible] Mussulman architecture." And [illegible] general use very shortly after the [illegible] do not say that the dogma *post hoc* [illegible] is always correct, but surely it is [illegible]

Again, let us look at this pro[illegible] and his followers sternly refused [illegible] anything in use either by Chris[illegible] Hindoo neighbours. Is it likel[illegible] copy the architecture of either? [illegible] would probably say, "I will [illegible] arches of those Christian dogs, [illegible] traves of the Hindoo idolators. [illegible] arches, make them of other for[illegible] stilted, or pointed. We copy [illegible] lievers in other matters, why do [illegible] ture?"

And now, begging pardon fo[illegible] waiting, we will return, and pu[illegible] him; for, unless we get him into [illegible] there is no knowing where to hav[illegible]

"We'll keep him to the qu[illegible]
And argue διαλεκτικῶς

First, then, we would respect [illegible] Scott surely (after such dictatic[illegible] *must* have an opinion on the subj[illegible] ders bring *any* style of architect[illegible] the West or *not*?

If they did, what style was it?

What the gentleman means [illegible] architecture of the East"—was t[illegible]

What he means by trying t[illegible] between the Pointed arch and I[illegible] How is the one to be separated fi[illegible] arch is not a form of ornament, but an essential part of construction. Perhaps he will also kindly inform us what Pointed architecture would or could be without the Pointed arch?

What he means by "the *already* Christian architecture of the soldiers of the Cross, who brought the idea home among the spoils," &c. If it were theirs before, they could not bring it back with them as spoils. His sentence, and all its *its*, evidently allude to Pointed architecture.

Is there any proof, or presumption, or the most remote probability, that any Christian building was ever erected anywhere in the Pointed style before A.D. 642?

If not, will he explain how the Crusaders found it among the Saracens, as a sort of Christian foundling?

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CREASE

PAGES

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CHURCH-BUILDING NEWS.

ent.—The new Congregational Chapel in ok-street was opened on the 8th instant. It the Decorated Gothic style, with tower and feet high. The interior of the chapel is feet by 40 feet, and will seat about 400 and there is a gallery under the large win- ch will hold about 100 more. The roof is rafters coloured and varnished; bays in the f the building, each bay having a pointed ndow in the centre. The organ is placed in d recess on the south side of the chapel. The of stained deal on a stone base, and stands on surmounted by an ornamental communion Behind the pulpit is an arch, forming a re- oss which is a carved screen, and above the small trefoil window in stained glass, repre- the Rose of Sharon and the Lily of the the floral emblems of our Saviour. Above the a wheel window with stained glass of deep lieved by orange and ruby. The architects ars. Landor and Bedell; and the builders, Dove (Brothers). The total cost of the new g is about 2,000*l.* 1,000*l.* of which has been

stall.—The new chapel of the Methodist New ction body at Tunstall has been opened. The of the structure is of stone. There is a recessed ade, with a main and side entrances; and two 2½ feet in diameter, of the Ionic order, sup- pediment, enriched with frieze work and cor- In the interior there is a gallery at the end ite the pulpit; and at the back of the pulpit a window, filled with stained glass. The chapel, which will seat between 500 and 600 persons, is heated with hot water, and lighted principally by two sunlights in the ceiling. The designs for the building were prepared by Mr. J. T. Fairbank, of Bradford, and the work has been executed by Mr. F. Batty.

Llanthewy Vach (*Monmouthshire*).—The parish church of Llanthewy Vach, which has been lately rebuilt, was consecrated on Tuesday before last, by the Bishop of Llandaff. The church had fallen into a state of decay, and has been restored in accordance with the original style, which is Gothic of the perpendicular period. Such of the old work as would allow of it has been replaced, and the additions made to correspond therewith. The church consists of a nave with a western bell turret, and south porch and chancel, with open timber roofs covered with stone tiles. The external and internal dressings are of freestone, and the gables are coped and surmounted by crosses. The east window is of three lights, with arched traceried head, and the rest of the local square-headed character. The nave is fitted with loose benches, pulpit, and font, and the chancel with stalls for the clergy, lectern and altar table. The cost of the whole of the works has been about 400*l.* The restoration has been effected from the designs of Messrs. Prichard and Seddon, the diocesan architects, by Mr. Thomas Williams, builder, of Croesyceiliog.

Sheffield.—St. John's Church, the foundation stone of which was laid on the 20th November, 1856, is approaching completion. The building is erected, the contractors for the mason's work have completed their contract, and all that remains to be done will be the plastering and fitting up of the interior. A stone-gabled bell turret has been erected over the chancel arch. The building, it is estimated, will cost about 2,000*l.* of which about 1,800*l.* have been collected. The site was presented by Mr. Edw. Newman. The style of architecture is the Geometric Middle-Pointed, and the total internal width of the edifice is 45 feet, while the length is 106 feet; the height of the nave, to the apex of the roof, being 56 feet. Accommodation will be afforded to 600 persons.

Barnsley.—The successful competitors for the several branches of work in the erection of a new church, in Worsbro' Dale, near Barnsley, are Mr. Taylor, stonemason; Mr. Hunt, joiner and carpenter; Mr. Wm. Brown, plumbing, glazing, and slating: Messrs. Jenkinson and Hall, plastering; and Mr. Charles Rogers, painting and staining.

Edinburgh.—The foundation stone of Dr. Alexander's new church, in Merchant-street, has been laid. The building is designed by Messrs. Hay, of Liverpool. According to the *Caledonian Mercury*, it will have a tower and steeple of an altitude of 120 feet, and the main building will be of Byzantine character. The cost of erection will be about 10,000*l.*

THE JOINERS OF MANCHESTER AND LONDON.

HONOURED SIR,—Having seen in your impression of last week a letter from a Manchester Joiner, complaining of what he calls the injustice of the builders of Manchester, I have been so forcibly struck with the wide difference between their case and ours, I could not withhold making a few observations relative to the cause of their strike.

I am a London joiner, and twenty years a journeyman: I might, therefore, be supposed to know something of the state of trade, and also the mind of London joiners respecting the Manchester strike. I do hope that you will, through your valuable and widely circulated journal, tell them that we think it perfectly ridiculous to dispute with masters about one, two, or three hours' work in a week, but in the name of (to use the words of the Manchester joiner) *common sense*, let them accept of any reasonable offer, and go to work. In the name of humanity, I would say, do not bring your labour to London. To give our Manchester fellow-workmen some idea of the present state of the building trade in London, I will mention a case in point where I am now employed. —— Park, in Islington is the scene of operation. Mr. —— is the architect and builder. All is carried out under a foreman in the usual way, and the property is first-class. The work is let at prices so low, that we are obliged to work from six in the morning till eight at night, not earning more than one pound four shilings per week. What will our Manchester Joiner think, when I tell him we have to make a 2-inch double-moulded door, 7 feet by 3 feet, for five shillings; also, 2-inch circular sashes and frames, of large dimensions, at eight shillings per opening; boxing shutters, &c. equally low.

I will not further infringe upon your valuable space, but subscribe myself your humble servant,

THOMAS PREEDY.

THE STRIKE OF JOINERS AND BRICKLAYERS AT MANCHESTER.—We are glad to learn, that shortly after the insertion of the communication in our columns from one of the workmen on strike, to which we appended a note on the subject, the joiners agreed to submit the matter in dispute to arbitration, and named Mr. Alderman Heywood as their arbitrator. The masters named Mr. Alderman Bancroft on their part; and the arbitrators shortly thereafter decided that the men should accept the offer of the masters, namely, the resumption of work on the understanding that fifty-eight hours in summer and fifty-five hours in winter be the weekly time given to work. This unfortunate strike, it is to be hoped, is therefore at an end, as the men are said to have resumed work on the above understanding.

PROCEEDINGS UNDER THE METROPOLITAN BUILDING ACT.

DIVISION OF WAREHOUSES CONTAINING MORE THAN 216,000 CUBIC FEET.

AT Guildhall, a few days ago, Mr. John Jay, the contractor, was summoned to answer the complaint of Mr. George Smith, the district surveyor for the southern division of the City of London, for omitting to comply with the Metropolitan Building Act of 1855, in the erection of premises belonging to Messrs. H. E. and M. Moses, merchants, situated in Cannon-street West, after due notice had been served upon him, requiring him to do certain things in compliance with the above Act.

Mr. Bodkin, in support of the summons, stated that the building was commenced in September, 1856, but the notices required from the builder were not supplied until some time after, and, upon the district surveyor viewing the premises, he observed indications in the party-wall running from the basement to the ground-floor, which induced him to suppose the wall

The building is 142 feet long by 42 feet wide, and will accommodate 3,000 persons standing, or 1,000 seated. The cost will be about the original estimate, or 3,505*l.* towards which 2,500*l.* have been raised by voluntary contributions, the remainder by mortgage on the borough rates, to be repaid by instalments of 100*l.* a-year.

Cheltenham.—The new casualty wards of Cheltenham General Hospital have been completed. The design was furnished by Mr. D. J. Humphris, and the contract was taken by Mr. W. Salisbury. The new wards, one for male and the other for female patients, are heated by steam, and ventilated. There are a reception-room, bath-room, and other apartments. The new wards were set in progress by a subscription of 1,000*l.*

Pontypridd.—The new bridge here was inaugurated on Friday in last week. It consists of three arches (40 feet span each), on the lower side of the original bridge, in the parishes of Llanwonno and Eglwysilan. The width of the roadway is 20 feet, length of bridge, 172 feet. The stone was from a quarry belonging to Mr. Morgan Edwards. The bridge cost altogether 1,575*l.* On the centre of the bridge is the following inscription:—"This bridge was erected A.D. 1157, by public subscription.—Designed by Robert Hughes, district-surveyor; and built by Thomas Jenkins." The work was paid for by instalments as the building progressed, viz. the first instalment of 450*l.* when the abutments and piers were up plinth high; 300*l.* when the abutments and piers were ready for fixing the curves; 450*l.* when the last key stone was driven; and 375*l.* three months afterwards.

Birmingham.—A new temperance-hall is being erected at Birmingham capable of seating 800 persons.

Newcastle.—The new corn-market was opened on Saturday week. It forms the centre portion of the corporation buildings in St. Nicholas-square. It is 164 feet long, 64 feet in breadth, and 22 feet high; and is lighted on each side by eleven windows, at an elevation of 20 feet from the ground; and by the same number of entresol windows, placed directly over these side windows, at a 12-feet higher level. Above the market is the music-hall, 170 feet in length by 64 feet in breadth, and 45 feet high, approached by four separate entrances, having stone staircases, to the hall. It has been suggested that the best mode of lighting the hall by night will be by sunlights, the method adopted at the Free-trade Hall, Manchester. The new music-hall will accommodate about 3,500 persons.

Clevedon.—National schools are erecting at Clevedon, a small and healthy watering-place, 12 miles from Bristol. They have been much wanted, and are being built by private subscription; Sir Arthur Elton, bart. M.P. for Bath; the Rev. Mr. Braikenridge, Mr. Jerdone Braikenridge, and Mr. Conrad Tinzel, of Clevedon, each subscribing 100*l.*; and by a grant from the Committee of Council on Education. Each of the schools (which are for boys and girls), is 45 feet by 19 feet; with a residence for the master and mistress. ...rials are the fine magnesian limestone of the ...ith ornamental tiles, in colours, for cover- ... style is Early Decorated Gothic. Messrs. Bindon, of Bristol, are the architects.

projectile—*ergo*, it was the age of gunnery,—and it is not impossible Philip Augustus used the Minié rifle!

No, sir, attempts have been made to show these were ages of faith, because people believed whatever they were told—for the best of all reasons, they had no power to examine; and ages of happiness, though the world was full of violence. But to endeavour to go further has been reserved for the present day. I fear we must sum the matter up in the words of a lively French writer, who says,—"In those times there was no science, not even in that which touches us all most nearly—our health. The king's physician was invariably a Jew or an Arabian; the king's fool was always a native."

On the next point, I find "Verax" is accused of having made sad mis-statements: he has said "the last new original style," "the last modern architecture," instead of "the latest original style of architecture," and "the architecture of the modern as distinguished from the ancient world:" he has also stated that the very same thing is called by the same writer "Mediæval;" and "the architecture of our forefathers" *in the next paragraph*, when, in strict truth, it is only *in the next page*. All sorts of hints are thrown out to lead people to believe that much turns on all this, and that "Verax" is perverting quotations and mis-stating facts. Can anything be more petty, more ungenerous? It would have been much better if Mr. Scott had answered "Verax's" question, how its being the last new style—I beg a thousand pardons, "the last new original style"—made it, *par excellence*, Christian. A newer style, then, it seems would depose it from its virtue and dignities. But "Verax" denies it is the last new original style of architecture: this he asserts to be that of iron and glass; and that the Italian (as much derived from the Roman as the Decorated from the Lancet) was another original intermediate style.

But now comes a really serious accusation of "a double mis-statement;" here are the words: "On the much-vexed question whether the Pointed arch was imported by the Crusaders from the East, he ('Verax') first converts it into a question whether Pointed *architecture*, instead of merely the *arch*, was so imported." This "Verax" does *not* do, for he does not see how they are to be separated: the other half of "the double mis-statement" is, that "Verax" makes out Mr. Scott *admitted* this, by purposely leaving out an *if* in transcribing the passage. In many instances there is much virtue in an *if*,—but in this there seems to be none. These are his very words,—I hope by an error of the press or transcriber these letters may not again fall out:—'If its [the Pointed arch's] systematic adoption can with certainty be traced to the suggestive architecture of the East, surely this does not unchristianize the already Christian architecture of the Soldiers of the Cross, who brought the idea home among the spoils won from their unbelieving foes." In the name of "conscience," as Mr. Scott talks so much of it, what is this but an admission,—ay, and that in spite of the *if* that he is so extravagantly anxious for? "*If* I did so and so, I did it with a good motive." Is not this an admission that something *was* done? "*If* I brought home the statue, I did not break the finger off." Is not this an admission of a fact? "If the Crusaders brought home something, they did not unchristianize it." Is not that an admission something was brought? But, probably Mr. Scott thinks he can blow hot and cold, and, if foiled in one part of his argument, can jump round his *if*, and take up a new position. This will not serve; there cannot be two truthful defences. It will not do for a thief to say, "I did not steal the horse, but *if* I did, I meant to send it back next day." His *if* would be considered an admission of the fact before any "conscientious" magistrate, and would infallibly send him to the sessions. It comes to this, the Crusaders brought something home or they did not. If they brought nothing home, what nonsense it is to talk of what happened to it by the way. The Americans are very fond of small jokes about *nothing*: "half nothing," "the small end of nothing whittled down;" but of all strange ideas the strangest would be to "unchristianize" nothing. If they brought *something*, what was it they brought? The passage under examination is certainly as obscure and involved as anything I ever read, and is probably intended not to be too closely scrutinized: if so, Mr. Scott has brought it on himself,—he forces us to try and unravel it.

But, before doing this, it will save time and smooth the way to have a word or two about Mr. Fergusson's book. Mr. Scott says it would not be easy to look through all he has written; it seems, however, he has gone as far back as 1849. His conclusion is, that the search does not help "Verax." Let us see what, in "Verax's" own words, Mr. Fergusson "shows."

And here it is really a relief to take up a book based on facts and dates. It would be well if every architectural critic wrote like Mr. Fergusson, as careful and as candid in speaking of a Hindu Vimana as of a Roman Basilica,—as unprejudiced in treating of the Parthenon as of Salisbury Cathedral,—and pursuing the only philosophical way to arrive at truth by collecting all his facts before he begins to deduce inferences. Now let us turn to page 383, *et seq.*:—Your readers will perhaps remember the year of the Hejra was 622, and that of the first Crusade 1096. Well, what does Mr. Fergusson show of undoubted Moslem or Saracenic architecture? The mosque of Caliph Omar, at Jerusalem, was built A.D. 637; the mosque of Amrou, at Cairo, 642; the mosque of El Aksah, at Jerusalem, 691; the mosque of Caliph Walid, at Damascus, 705; the mosque of Ebn Touloun, at Cairo, 876; the mosque of El Azhar, at Cairo, 981; the mosque of Sultan Barkook, at Cairo, 1149; several others, also, of later date. Of these he gives five very clever illustrations; and I am sure, to any unprejudiced mind, a few glances will show these to be the models or precursors of our Pointed architecture.

But let any one go through his book, and after that look to any other work wherein views of Moslem architecture are contained, and there cannot be a doubt of the resemblance. I remember once standing before the magnificent west front of Peterborough Cathedral in company with an old Indian officer, when he said, "Why, this is just what we see throughout the East: huge pointed portals running up to the top of the building; spires, pinnacles—everything like the minarets—the aspiring character of Mussulman architecture." And this style came into general use very shortly after the great Crusade. We do not say that the dogma *post hoc, ergo propter hoc* is always correct, but surely it is in this instance.

Again, let us look at this probability. Mahomet and his followers sternly refused to follow or copy anything in use either by Christians, Jews, or their Hindoo neighbours. Is it likely, then, they would copy the architecture of either? The reigning Caliph would probably say, "I will not have the round arches of those Christian dogs, nor the level architraves of the Hindoo idolators. If we are to have arches, make them of other forms,—horse-shoe, or stilted, or pointed. We copy nothing from unbelievers in other matters, why do so in their architecture?"

And now, begging pardon for keeping Mr. Scott waiting, we will return, and put a few questions to him; for, unless we get him into a corner, it is clear there is no knowing where to have him,—

> "We'll keep him to the question close,
> And argue διαλεκτικῶς.

First, then, we would respectfully ask,—and Mr. Scott surely (after such dictation to other people) *must* have an opinion on the subject,—did the Crusaders bring *any* style of architecture from the East to the West or *not*?

If they did, what style was it?

What the gentleman means by "the suggestive architecture of the East"—was this Pointed or not?

What he means by trying to set up a difference between the Pointed arch and Pointed architecture? How is the one to be separated from the other? The arch is not a form of ornament, but an essential part of construction. Perhaps he will also kindly inform us what Pointed architecture would or could be without the Pointed arch?

What he means by "the *already* Christian architecture of the soldiers of the Cross, who brought the idea home among the spoils," &c. If it were theirs before, they could not bring it back with them as spoils. His sentence, and all its *ils*, evidently allude to Pointed architecture.

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Will he also tell us why a man cannot be master of two styles of architecture, Classic and Gothic, as well as of one, and why those who confessedly are masters of both, should be branded as enemies of the latter, against all truth and reason? Why the Puginites should alone arrogate to themselves the knowledge of Pointed architecture? Why, when "Verax" and his friends are doing all they can to save Pointed architecture from the consequences of the blundering and misstatements of others, and wish to bring them back to the only safe path, that of truth and soberness, an answer should be put forth, headed in capitals, "the statements of the *opponents* of Gothic architecture?"

Will he also tell us what he means by "young saints?" for "Verax" never used such an expression. And here it gives me the greatest pleasure to say, that among the rising young men both of the Institute and Association, there is quite as much a desire to get out of the trammels of "Puginism" as of the old "five orders" school. They wish as the world progresses that new forms of beauty should develope themselves, to meet the varied sentiments that every day arise,—not as the *Eclecticisti* of Italy attempted to make a hodge-podge of different beauties, and stick a peacock's tail to a leopard's head; nor to put a bit of Newgate below, and York Minster above; but to get more weapons to their armoury, more instruments to their observatory, more colours to their palettes; so that different and more varied sentiments might be better represented by the increased means afforded to them.

In conclusion, I will now venture to relate to Mr. Scott a story which occurred during the Crusades. It is related by the author of the "Histoire Générale:"—During one of the truces between them and the Saracens, the latter asked seriously why it was they had left their homes and travelled so many long miles, and wherein they, the Moslems, had offended them, that they sought their blood in such a vengeful way? The Crusaders said,—It was because they, the Saracens, were unbelievers; they had put to death our Lord; that they were idolators, and in particular worshipped two great idols, called Mahound and Termagunt. The Saracens answered that they were most sadly mistaken; it was the Jews who had put to death Issa Ben Mariam (Jesus, son of Mary) 600 years before there were any Mahometans; that as to images they abhorred them; so far from worshipping them, they never suffered the likeness of anything to be made, not even in a picture; they worshipped Allah, and him only, while the Christians had images in all their churches, bowed down to them, burnt incense before them, lighted candles in their honour, and worshipped them; and they entreated the Christians to come into their mosques and houses, and see for themselves whether there were any idols there or not. It was all of no use. The Christians were so blinded by prejudice they would not believe the evidence of their own senses, and they went on devoutly cutting the Saracens' throats because they had killed the Lord of Life, and because they worshipped two great idols, Mahound and Termagunt.

Are there not in the present day some people as much blinded by prejudice as those Crusaders were? Your readers will probably think so. VERAX.

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LECTURE ON THE MUSEUM OF ART.

ON Monday, the 14th, Mr. J. C. Robinson, F.S.A. read an address in the Theatre of the Department at Brompton, on the Museum of Art, in which he traced the growth of the collection, and urged its value in popularizing knowledge. After answering some objections, and pleading for museums in general, he proceeded to describe the classes of objects contained in the collection. With reference to the increase in the value of fine specimens which has taken place, Mr. Robinson said,—

"Specific instances, in any number, might be adduced in support of what has been now advanced; time, however, will only allow of the briefest possible allusion to one or two: the rise in value in one class, in which our collection fortunately possesses a most important series, has been so sudden and remarkable, as to be worth special notice. Four or five years ago the most beautiful specimens of Italian majolica ware might have been purchased at dealers' shops and London auctions at from a few shillings to at most a few pounds, say 5*l.* or 10*l.* at the highest; whilst in Italy a few scudi or dollars would purchase the finest piece. Now these same pieces will sell for 20*l.* 50*l.* 100*l.* 200*l.*; nay, I dare scarcely place a limit to the value of the finest specimens. As an instance, the most seemingly extravagant price ever heard of until then was given in Italy, not four years ago, for a fine majolica plate. After being refused by dealers and amateurs without number, on account of its supposed exorbitant price, 12*l.* English, demanded by its owner, this long-coveted specimen was purchased by a French dealer. This year this same piece was publicly sold by auction in Paris for the sum of 450*l.* and brought in triumph to this country by its purchaser, a celebrated English amateur; and this Museum has, in times not long gone by, made numerous acquisitions in the same direction, which, if now brought to the hammer, would yield a similarly fabulous increase. The Bernal Collection, which two short years ago was offered intact to Government, and declined, for 40,000*l.* and subsequently realised upwards of 60,000*l.* by public auction, would now probably be worth 100,000*l.*; and the purchases made for the Museum of Art on that occasion, as they were the choicest treasures of the collection, would, without doubt, yield a still higher rate of profit."

The lecture is published by Chapman and Hall, at a nominal price.

PROVINCIAL NEWS.

Maidenhead.—The new county police-station here is nearly finished. It is built with red and white bricks, pointed black, and inclosed within a wall of open brickwork, with freestone coping, nearly 5 feet high. The court where the divisional petty sessions will be held is 28 feet long, 18 feet wide, and 18 feet high. The cells for prisoners are 11 feet long, nearly 6 feet wide, and 10 feet high. Each is supplied with a water-closet, and is warmed and ventilated. The building was erected by Mr. James Dormer, of Reading, from a design by Mr. J. B. Clacy, the county surveyor.

Devizes.—The new corn exchange has been opened. The building is 142 feet long by 42 feet wide, and will accommodate 3,000 persons standing, or 1,000 seated. The cost will be about the original estimate, or 3,505*l.* towards which 2,500*l.* have been raised by voluntary contributions, the remainder by mortgage on the borough rates, to be repaid by instalments of 100*l.* a-year.

Cheltenham.—The new casualty wards of Cheltenham General Hospital have been completed. The design was furnished by Mr. D. J. Humphris, and the contract was taken by Mr. W. Salisbury. The new wards, one for male and the other for female patients, are heated by steam, and ventilated. There are a reception-room, bath-room, and other apartments. The new wards were set in progress by a subscription of 1,000*l.*

Pontypridd.—The new bridge here was inaugurated on Friday in last week. It consists of three arches (40 feet span each), on the lower side of the original bridge, in the parishes of Llanwonno and Eglwysilan. The width of the roadway is 20 feet, length of bridge, 172 feet. The stone was from a quarry belonging to Mr. Morgan Edwards. The bridge cost altogether 1,575*l.* On the centre of the bridge is the following inscription:—"This bridge was erected A.D. 1157, by public subscription.—Designed by Robert Hughes, district-surveyor; and built by Thomas Jenkins." The work was paid for by instalments as the building progressed, viz. the first instalment of 450*l.* when the abutments and piers were up plinth high; 300*l.* when the abutments and piers were ready for fixing the curves; 450*l.* when the last key stone was driven; and 375*l.* three months afterwards.

Birmingham.—A new temperance-hall is being erected at Birmingham capable of seating 800 persons.

Newcastle.—The new corn-market was opened on Saturday week. It forms the centre portion of the corporation buildings in St. Nicholas-square. It is 164 feet long, 64 feet in breadth, and 22 feet high; and is lighted on each side by eleven windows, at an elevation of 20 feet from the ground; and by the same number of entresol windows, placed directly over these side windows, at a 12-feet higher level. Above the market is the music-hall, 170 feet in length by 64 feet in breadth, and 45 feet high, approached by four separate entrances, having stone staircases, to the hall. It has been suggested that the best mode of lighting the hall by night will be by sunlights, the method adopted at the Free-trade Hall, Manchester. The new music-hall will accommodate about 3,500 persons.

Clevedon.—National schools are erecting at Clevedon, a small and healthy watering-place, 12 miles from Bristol. They have been much wanted, and are being built by private subscription; Sir Arthur Elton, bart. M.P. for Bath; the Rev. Mr. Braikenridge, Mr. Jerdone Braikenridge, and Mr. Conrad Tinzel, of Clevedon, each subscribing 100*l.*; and by a grant from the Committee of Council on Education. Each of the schools (which are for boys and girls), is 45 feet by 19 feet; with a residence for the master and mistress. The materials are the fine magnesian limestone of the vicinity, with ornamental tiles, in colours, for covering. The style is Early Decorated Gothic. Messrs. Pope and Bindon, of Bristol, are the architects.

CHURCH-BUILDING NEWS.

Cheshunt.—The new Congregational Chapel in Crossbrook-street was opened on the 8th instant. It is built in the Decorated Gothic style, with tower and spire 85 feet high. The interior of the chapel is about 60 feet by 40 feet, and will seat about 400 persons; and there is a gallery under the large window which will hold about 100 more. The roof is open, the rafters coloured and varnished; bays in the length of the building, each bay having a pointed stone window in the centre. The organ is placed in an arched recess on the south side of the chapel. The pulpit is of stained deal on a stone base, and stands on a pillar, surmounted by an ornamental communion railing. Behind the pulpit is an arch, forming a recess, across which is a carved screen, and above the screen a small trefoil window in stained glass, representing the Rose of Sharon and the Lily of the Valley, the floral emblems of our Saviour. Above the arch is a wheel window with stained glass of deep blue, relieved by orange and ruby. The architects are Messrs. Landor and Bedell; and the builders, Messrs. Dove (Brothers). The total cost of the new building is about 2,000*l.* 1,000*l.* of which has been paid.

Tunstall.—The new chapel of the Methodist New Connection body at Tunstall has been opened. The front of the structure is of stone. There is a recessed colonnade, with a main and side entrances; and two pillars, 2½ feet in diameter, of the Ionic order, support a pediment, enriched with frieze work and cornice. In the interior there is a gallery at the end opposite the pulpit; and at the back of the pulpit a window, filled with stained glass. The chapel, which will seat between 500 and 600 persons, is heated with hot water, and lighted principally by two sunlights in the ceiling. The designs for the building were prepared by Mr. J. T. Fairbank, of Bradford, and the work has been executed by Mr. F. Batty.

Llanthewy Vach (Monmouthshire).—The parish church of Llanthewy Vach, which has been lately rebuilt, was consecrated on Tuesday before last, by the Bishop of Llandaff. The church had fallen into a state of decay, and has been restored in accordance with the original style, which is Gothic of the perpendicular period. Such of the old work as would allow of it has been replaced, and the additions made to correspond therewith. The church consists of a nave with a western bell turret, and south porch and chancel, with open timber roofs covered with stone tiles. The external and internal dressings are of freestone, and the gables are coped and surmounted by crosses. The east window is of three lights, with arched traceried head, and the rest of the local square-headed character. The nave is fitted with loose benches, pulpit, and font, and the chancel with stalls for the clergy, lectern and altar table. The cost of the whole of the works has been about 400*l.* The restoration has been effected from the designs of Messrs. Prichard and Seddon, the diocesan architects, by Mr. Thomas Williams, builder, of Croesyceiliog.

Sheffield.—St. John's Church, the foundation stone of which was laid on the 20th November, 1856, is approaching completion. The building is erected, the contractors for the mason's work have completed their contract, and all that remains to be done will be the plastering and fitting up of the interior. A stone-gabled bell turret has been erected over the chancel arch. The building, it is estimated, will cost about 2,000*l.* of which about 1,800*l.* have been collected. The site was presented by Mr. Edw. Newman. The style of architecture is the Geometric Middle-Pointed, and the total internal width of the edifice is 45 feet, while the length is 106 feet; the height of the nave, to the apex of the roof, being 56 feet. Accommodation will be afforded to 600 persons.

Barnsley.—The successful competitors for the several branches of work in the erection of a new church, in Worsbro' Dale, near Barnsley, are Mr. Taylor, stonemason; Mr. Hunt, joiner and carpenter; Mr. Wm. Brown, plumbing, glazing, and slating: Messrs. Jenkinson and Hall, plastering; and Mr. Charles Rogers, painting and staining.

Edinburgh.—The foundation stone of Dr. Alexander's new church, in Merchant-street, has been laid. The building is designed by Messrs. Hay, of Liverpool. According to the *Caledonian Mercury*, it will have a tower and steeple of an altitude of 120 feet, and the main building will be of Byzantine character. The cost of erection will be about 10,000*l.*

THE JOINERS OF MANCHESTER AND LONDON.

HONOURED SIR,—Having seen in your impression of last week a letter from a Manchester Joiner, complaining of what he calls the injustice of the builders of Manchester, I have been so forcibly struck with the wide difference between their case and ours, I could not withhold making a few observations relative to the cause of their strike.

I am a London joiner, and twenty years a journeyman: I might, therefore, be supposed to know something of the state of trade, and also the mind of London joiners respecting the Manchester strike. I do hope that you will, through your valuable and widely circulated journal, tell them that we think it perfectly ridiculous to dispute with masters about one, two, or three hours' work in a week, but in the name of (to use the words of the Manchester joiner) *common sense*, let them accept of any reasonable offer, and go to work. In the name of humanity, I would say, do not bring your labour to London. To give our Manchester fellow-workmen some idea of the present state of the building trade in London, I will mention a case in point where I am now employed. —— Park, in Islington is the scene of operation. Mr. —— is the architect and builder. All is carried out under a foreman in the usual way, and the property is first-class. The work is let at prices so low, that we are obliged to work from six in the morning till eight at night, not earning more than one pound four shilings per week. What will our Manchester Joiner think, when I tell him we have to make a 2-inch double-moulded door, 7 feet by 3 feet, for five shillings; also, 2-inch circular sashes and frames, of large dimensions, at eight shillings per opening; boxing shutters, &c. equally low.

I will not further infringe upon your valuable space, but subscribe myself your humble servant,

THOMAS PREEDY.

THE STRIKE OF JOINERS AND BRICKLAYERS AT MANCHESTER.—We are glad to learn, that shortly after the insertion of the communication in our columns from one of the workmen on strike, to which we appended a note on the subject, the joiners agreed to submit the matter in dispute to arbitration, and named Mr. Alderman Heywood as their arbitrator. The masters named Mr. Alderman Bancroft on their part; and the arbitrators shortly thereafter decided that the men should accept the offer of the masters, namely, the resumption of work on the understanding that fifty-eight hours in summer and fifty-five hours in winter be the weekly time given to work. This unfortunate strike, it is to be hoped, is therefore at an end, as the men are said to have resumed work on the above understanding.

PROCEEDINGS UNDER THE METROPOLITAN BUILDING ACT.

DIVISION OF WAREHOUSES CONTAINING MORE THAN 216,000 CUBIC FEET.

AT Guildhall, a few days ago, Mr. John Jay, the contractor, was summoned to answer the complaint of Mr. George Smith, the district surveyor for the southern division of the City of London, for omitting to comply with the Metropolitan Building Act of 1855, in the erection of premises belonging to Messrs. H. E. and M. Moses, merchants, situated in Cannon-street West, after due notice had been served upon him, requiring him to do certain things in compliance with the above Act.

Mr. Bodkin, in support of the summons, stated that the building was commenced in September, 1856, but the notices required from the builder were not supplied until some time after, and, upon the district surveyor viewing the premises, he observed indications in the party-wall running from the basement to the ground-floor, which induced him to suppose the wall

was intended to be carried up to the top of the building, and if that had been done there would have been no complaint, as the builder would then have complied with the Act of Parliament, which requires that no building used as a warehouse for the purposes of trade should be allowed, where the number of cubic feet exceeded 216,000, without a party-wall. But, by the omission complained of, there was an undivided space amounting to about 350,000 cubic feet, which was clearly an infraction of the Act in question.

Evidence was then given of the service of a notice by the district surveyor upon Mr. Jay, the builder, requiring him to build up the party-wall, the date of that notice being the 12th of June last, and of his non-compliance with the Act of Parliament up to the present time.

Mr. Hawkins, in reply, contended that, as the building was completed, Mr. Jay's contract was at an end, and consequently he was no longer "the builder engaged in erecting" the premises, within the meaning of the Act. The premises were completed in May last, and the notice from the district surveyor was not served until June, and the summons was not taken out until nearly six months after that notice. It was *laches* on the part of the surveyor, and it would be a hardship if Mr. Jay was to be liable at any time to the penalties of this act for any irregularity in any building he might have erected, when it was the duty of the surveyor to point out such irregularity at the time, and before the completion of the building. If the magistrate made an order upon him, it would be requiring him to do an act which the law forbids; for, if called upon to make the necessary alterations, Messrs. Moses would not permit it, and Mr. Jay would commit a trespass, for which he would be liable to an action, if he obeyed the order.

Alderman Challis said he had read the Act carefully, and after giving his most considerate attention to the evidence and the arguments advanced, he felt it his duty to dismiss the summons, and he did so on the ground that proper notice had not been given while the building was in progress. He could not help remarking, also, upon the time allowed to elapse before the summons was taken out.

An application for the expenses of the defence was refused.

District surveyors are in this unfortunate position, that if they act rigorously in accordance with the words of the Act, they are termed tyrannical, and abused by those who are not acquainted with the law; while if they seek by repeated requests and long waiting to avoid harsh measures, they are upbraided for neglect of duty.

OUTBUILDINGS.

At Lambeth, some time ago, John Wood, a jobbing carpenter, was summoned by Mr. Stow, the district surveyor of Camberwell district, to show cause why an order should not be made on him by the magistrate, compelling him to take down a certain building which he, as a "builder," had erected, the same not being in conformity with the provisions of the Building Act.

The building in question (alleged to be a pigstye), measures on plan 14 feet 8 inches by 8 feet 6 inches, and in height to the underside of ridge (of span roof), 7 feet, to eaves, 5 feet 9 inches. The builder, it was stated, availing himself of the boarded fences, enclosing the end and sides of garden at the rear of house, raised two gables, constructed the roof, covered it with slates, and enclosed the front or side, next the dwelling-house and offices, with quartering and boarding, in which were left a doorway and opening for small sash-frame. For default of notice, district surveyor had summoned Wood, and he was fined by magistrate 20s. and 2s. costs.

On appearing to answer summons for irregularity, Wood professed willingness to amend, and stated that on applying for leave to enter the premises, the building owner objected, and threatened that legal proceedings would be taken, in the event of his so doing, for trespass. Thereupon the magistrate expressed unwillingness to make an order on defendant, and suggested that the building owner should be proceeded against (no powers are given by Metropolitan Building Act), or that the district surveyor should proceed to cause compliance in person, and recover from owner.

At this stage of the proceedings, the magistrate gave the district surveyor to understand that in cases where due notice of building had not been given to the district surveyor, he entertain a doubt as to power of the district surveyor to proceed, under the 45th section of the Metropolitan Building Act, against defendant, giving it to be his opinion that such notice should be given to the builder, "whilst engaged in erecting," &c. &c. and that notice of irregularity served on builder, after completion of works, would not hold good. He stated his opinion that the whole Act was a "blundering piece of legislation," and eventually the case was postponed for a fortnight to give his worship time to consider the matter. Ultimately the magistrate determined that the structure should be pulled down; and the building owner, still objecting to allow Wood to come on the premises, undertook to remedy the irregularity himself.

We have received some somewhat harsh comments on the proceedings of the district surveyor in this case. A little further consideration would probably show our correspondent that the district surveyor would have neglected his duty if he had acted otherwise. If buildings of wood, 14 feet by 8 feet, or 4 feet by 8 feet, were permitted, it would not merely be in contravention of the law (notwithstanding the absence of any definition in the Act of what is a "building"), but would lead to a very dangerous condition of things, and render the provisions of the Act to a great extent nugatory.

COMMUNICATION ON RAILWAYS.

In a recent number we noticed a means of communication between the guard and driver of a railway-train proposed by Mr. Symons, consisting of a sliding footrail, to be worked along the side of the carriages whilst in motion, and a string signal. Wishing much to see railway officials brought to a sense of duty due to the public and the millions of human beings that are annually hurled along these mighty causeways of intercourse, in adopting *a proper means of securing safety transit*, we now call attention to a mode of communication afforded by Messrs. Myers and Askew's "Railway Signal Brake." The invention consists of a self-connecting oral communicator or phonic rotary tube, which is fitted under the carriages, with spring connecting spring mouth-pieces, together with a whistle and alarums at each end. The spring mouth-pieces placed in the intermediate carriages enable the passengers to converse with the guard, and the guard to answer. When the tube is rotated by the guard, it strikes the alarums, and raises before the driver a signal or semaphore, directing him to stand by his engine, or the driver can do a similar act to the guard. Should the guard be asleep, and not hear the alarums, by an attachment from the signal it will pull him towards the brake-wheel. The rotating is then stopped, the whistle sounded, and the conversation between the one and the other takes place. The whole of the apparatus is worked off the brake screw, which is like the ordinary screw now in use, only working horizontally, and putting on a very rigid brake, which acts on three-fourths of each wheel, and its retarding power can extend throughout the train, if required. Surely, from the numerous inventions relating to this matter, railway managers would have no difficulty in selecting one to meet the existing exigencies.

WANT OF SANITARY KNOWLEDGE ASHORE AND AFLOAT.

The public are greatly indebted to you for keeping the sanitary question constantly before them, for by that means you will indoctrinate the rising generation with sanitary knowledge, so necessary for their health, the want of which is greater than many persons have any idea of; for when one sees servants taking the bells off the traps in sinks and areas to let the water run off faster, and by that means allow the stench from the drains to penetrate into the house, I think the public will agree with me that they are indebted to you for keeping the sanitary question constantly before them.

In reference to sanitary knowledge on board ship, I can speak from personal experience of the want of even the slightest attempt at ventilation; and when I recollect the dreadful stench there was between decks with 500 emigrants on board, it almost makes me sick. And what is the condition of ships' crews in the merchant service, with the ship laden to the beams, and the forecastle half filled with cargo, in which fifteen or twenty men have to eat and stye, without any ventilation but that which they get from the scuttle-hatch, which is almost always closed? It is, therefore, not surprising that fevers are on board ship, when there is no ventilation. And what would the consequence be of a number of men sleeping in such an atmosphere, if it was not for the bountiful supply of fresh air they inhale when on deck? And although the strong and hardy sailor may not feel it at first, yet I think it must in time undermine his constitution. But what must be the effect on a poor fellow stricken with fever, and who is confined to his hammock, and cannot get the fresh air every four hours that his more hardy shipmate can? And when he wants to moisten his fevered lips, the water in the bucket will make him heave at it, through being slung to a beam, and having absorbed the effluvia which is generated in such a confined atmosphere; for if a bucket of water placed in a fresh-painted house will absorb the effluvia arising from fresh paint, I think water placed in a ship's forecastle as I have described, will become saturated with the effluvia, and not be fit to drink.

Now, sir, I think these two great evils,—the want of ventilation and pure water—are very easily remedied. Those gentlemen who so kindly provide sailors' homes on shore should turn their attention to sailors' homes afloat, where the greater part of Jack's life is spent, and insist upon ships being provided with ventilators, which might be easily done if they were compelled to have them. Suppose it was a perforated iron pipe, running from the ship's quarter the whole length of the ship round the forecastle, that would admit the fresh air without any draught; and an upshaft over the lamp, so constructed as to prevent a down-draught, to carry off the smoke and any smell. And for the price of a few shillings a ship could be provided with a filterer, with an air-tight cover, made to dip into a flange filled with water, which would trap the cover, and might be slung in the place of the bucket, now in use; and then the crew would drink pure and tasteless water. A Workman.

THE COMPETITION DESIGNS FOR GOVERNMENT OFFICES.

ARCHITECTURAL INSTITUTE OF SCOTLAND.

The rewarded designs for proposed Government offices are now being exhibited in George-street Hall, Edinburgh. At the annual meeting of the Architectural Institute of Scotland, held a few evenings ago, Mr. Matheson, of her Majesty's Board of Works, read a paper with reference to them. In the course of it he read a letter from Mr. Burn, one of the judges, which gave some little information as to the proceedings of the judges.

Mr. Burn said, "Out of the 218 designs, the judges selected sixty-seven for further consideration and for a report upon them by the assessors, Messrs. Angell and Pownall, to whom they were remitted to ascertain how far they had complied with the instructions issued by Government: and during the period of this remit, nine other designs were added to the sixty-seven, making in all seventy-six designs in the selected list, which, thereafter, the judges examined in detail, accompanied by the assessors, and finally out of that number made choice of the designs which appeared to them entitled to the premiums offered. I have no means of ascertaining whether any designs were rejected as being too late of arrival. The designs were all hung and exhibited to the public before the judges were appointed, who had nothing to do with the arrangements of the Board of Works; and as no estimates were required from competitors, and none accordingly were given, it was no part of the duty of the judges either to consider the cost of the buildings, or offer an opinion as to their probable expense. In fact, neither competitors nor judges were in any shape required to make the probable cost a matter of consideration."

Mr. Matheson said at the conclusion of his paper,—"These designs have now become the property of the country. Whether they be carried into execution or not, we highly appreciate their merits, which do infinite credit to their authors. They will be preserved as valuable memorials, testifying to the present advanced state in this country of the true principles of architecture in its most admired styles and orders, and which it is our privilege, our duty, and interest diligently to study."

It has been suggested, that during the exhibition of the drawings, separate papers on the style of architecture of each design should be read by various members of the council.

INSTITUTION OF CIVIL ENGINEERS.

At the meeting on the 8th instant (Mr. Robert Stephenson, M.P. in the chair), the paper read was "An Account of the Steam Ferry over the River Nile, at Kaffre Azzayat, Egypt," by Mr. T. Sopwith.

This ferry was situated on the line of railway extending from Alexandria to Cairo, and was about midway between those places. It was intended to convey, temporarily, until a more permanent and fixed structure, now in course of erection, could be completed, the railway trains and engines between Kaffre Lais and Kaffre Azzayat, towns situated on opposite banks of the river Nile.

In the discussion, the cost was stated to have been 18,000*l.* including the jetties at both ends, carried on Mitchell's screw piles, with protecting cylinders at the extremities. The method of sinking the cylinders was by Hughes's pneumatic plan of using a "plenum" instead of a vacuum. The mode of attaching the chains on the two shores was by having weights rising and falling within a cylinder, at each extremity, to compensate for the drag upon the chains.

As an illustration of the mode of management of the line, it was stated that at one period there was only one train each way every other day, although the natives had evinced a great desire to travel, and the line connecting towns containing large populations. A hope was expressed that contact with the energetic engineers, in the service of the Pacha, would in due

time break down such dilatory habits and perverse adherence to antiquated customs, and that the benefits anticipated from the establishment of the railway would be realised.

In the construction of the machinery of the ferry, great credit was awarded to the late Mr. C. H. Wild and Mr. Dempsey for the details of the machinery; to Mr. George Robert Stephenson for the method of lifting the platforms; and to Mr. Rouse and Mr. McLaren for putting together and erecting the whole, and making it work thoroughly well.

GLASGOW ARCHÆOLOGICAL SOCIETY.

THE CATHEDRAL.

THE members of this society and their friends, including many ladies, met last Saturday in the cathedral. The place of rendezvous was the Chapter-house, where, shortly after twelve o'clock, the chair was taken by Mr. Rochead. After the transaction of the usual private business of the society, the chairman delivered an address, in which he explained the object of the meeting, and the proposed order of proceedings, which was, that they should examine the crypt, under the guidance of Mr. Honeyman, the choir, Lady Chapel, and Chapter-house, with Mr. Rochead, the nave with Mr. Baird, and the exterior with Mr. Bell.

Before leaving the Chapter-house, Mr. Honeyman pointed out, with the aid of diagrams, the most striking characteristics of the varieties of Gothic architecture which were practised during the twelfth and thirteenth centuries, in order that those present, who had not studied the subject, might be able intelligently to follow his remarks when explaining the peculiarities of the crypt and the evidences of its antiquity. The meeting then adjourned to the crypt, where the first object which claimed their attention was a painted notice, intimating that that part of the edifice was erected in 1175. Mr. Honeyman showed the absurdity of this statement, by comparing drawings of details from Jedburgh Abbey, the Galilee at Durham, and other buildings erected about that period, with the comparatively late details of the crypt. He said that he would not have considered it necessary to occupy the time of the meeting by any reference to this subject, were it not that the authorities still persisted in misleading visitors by these incorrect notices, which are prominently displayed in the various parts of the building; and he suggested that the society should represent to the custodians of the cathedral the propriety of altering these descriptive cards. Several members expressed their concurrence in these views.

In the choir the chairman gave a brief historical sketch of that part of the building, and commented on its more prominent architectural beauties. He also adverted in eulogistic terms to the alterations recently completed under the direction of Mr. Matheson, architect to her Majesty's Board of Works for Scotland.

Mr. Baird delivered an interesting address in the nave, in which, *inter alia*, he called attention to the gradual change which took place in the style of Gothic architecture towards the close of the thirteenth century, as exemplified in that part of the cathedral, and the gradual development of tracery as exhibited in the windows.

The meeting then made a survey of the exterior and the site of the ancient archiepiscopal palace, which seems to have been a place of considerable strength.

DRAWING-ROOM ORNAMENTS.

As the chief object of your journal is to improve the public taste in everything connected with dwellings—from digging the foundations to finishing the apartments,—I forward you a few hints on drawing-room ornaments.

The variety of ornaments frequently spread over the surface of drawing-room tables and shelves, or which may be found disseminated through the general sitting-room, often serves as an index to the mind and character of the individual to whom they belong. Our appreciation of beauty entirely depending upon our education, the amount and general tendency of that education may be as unmistakably traced in our homes as in our conversation. One individual will think it necessary to have ornaments either costly in material or elaborate in workmanship, while the eyes of another will as satisfactorily rest upon the simplest of Nature's works. If the amount of pleasure afforded by these two extremes could be accurately measured, I doubt not that the latter would greatly preponderate over the former. Why? Because the resources for contemplation are more extensive, and of a higher character. The mind that would dwell with delight upon a fresh-cut cabbage-leaf with a dew-drop glistening on its waxy bloom, would indeed be envied by that which sought to display the best selection from Soho Bazaar, could it for a short time investigate all the phenomena which combine to form that commonest produce of the kitchen-garden.

Money will not purchase the power of doing this; but it is the rich reward of the labourer in the field of science. Let me, therefore, recommend those who are entering life, and expecting some day to want "drawing-room ornaments," to choose the cheapest and most delightful mode of procuring them; and, although they may not exactly select the cabbage-leaf, the same course of study which teaches them to appreciate that, will secure to them an endless variety of beautiful things to charm the eye and delight the understanding.

MATER.

DECIMAL STANDARD FOR ADMEASUREMENT.

HAVING noticed in a late number of your paper some remarks on decimal calculations, it brings to mind some ideas that I have entertained for several years of the great desirability of adopting a decimal standard of *admeasurement*. It would save much trouble to surveyors, engineers, and other scientific men. The following plan seems calculated to meet the purpose: if not, some member of the profession may probably suggest an improvement. To interfere as little as possible with the present scale, I take the inch for a standard.

1·000 rods,
1·00 feet,
1·0 inches,
or, 10 inches, 1 foot; 10 feet, 1 rod;

and, to assimilate this with the present measures, one foot, or one yard lineal, would be 1·2 of decimal measure; or a running measure of any number of feet, say 30, could be reduced to old measure by adding a cypher and dividing by twelve, thus:—300 in. ÷ 12 in. = 25 ft. duodecimal measure.—S. J. BARBER

THE SUFFOLK-STREET GALLERY.

THE advertisement of the Architectural Society in the *Builder* of the last and preceding weeks contains an error, which I trust you will do me the favour to correct. It states that "the *repairs* of the large room (the Gallery of the Society of British Artists) seem likely to be incomplete by the 1st of December." This is scarcely just towards the architect and the society. There have been no repairs of the gallery. The roof has been entirely rebuilt (a portion of the walls also), and upon a principle, both as to its construction and mode of lighting, totally different from Mr. Nash's work (the former roof), which, although raised with a cost unlimited, both as to labour and material, was so essentially defective in the first principles of construction, that it was found unadvisable to attempt to repair it.

The subject of construction, in respect to the lighting of galleries for pictures and sculpture, has of late acquired an interest and attracted public attention, from the general defectiveness of our public galleries in this respect, and their inferiority to most of those of the continent, as well as from the papers upon the subject, published of late years by Sir Charles Eastlake, the more elaborate ones by Mr. Pyne, and the recent lecture delivered at the South Kensington Museum by Mr. Redgrave. In erecting the new gallery (for such it really is) in Suffolk-street, the true principle of lighting a gallery has been attempted to be carried out. The Government building at South Kensington exhibits an advance in the right direction as to the mode of lighting, although, in respect to architectural symmetry or beauty, it is not superior to ordinary railway stations.

F. Y. HURLSTONE.

DAMP HOUSES.

IN looking the other day at some dwellings which had not been long erected, in a comparatively dry and lofty portion of the metropolis, the ravages of damp were seen to reach even to the first floor, and after hearing the complaints in consequence, we were told how papers and books became mildewed, that the paint and other covering of the walls peeled off, how the linen in drawers was not safe, of fusty smells, the aged, and indeed those not so old, having sometimes sharp hints of rheumatism, children constantly catching colds, and other troubles.

There are not many worse things than a damp and mouldy house. It is an ancient evil, and although damp is one of the chief destroyers of house property, it has not yet, in many cases, found a remedy. When thinking of these matters, we remembered the particular signs of leprosy in a house, and the means of cure mentioned in the 14th chapter of Leviticus, beginning at the 34th verse, part of which we quote:—

"When ye be come into the land of Canaan, which I give you for a possession, and I put the plague of leprosy in a house of the land of your possession,"—

The owner of the house is ordered to tell the priest, saying,—"It seemeth to me there is, as it were, a plague in the house." The priest issues a command that they empty the house before he goes in to see the plague, "that all that is within the house shall not be made unclean." If when the priest looks upon the walls he finds "hollow strakes, greenish or reddish, which are lower than the wall," he then shuts up the house for seven days; and if, on his return, he finds the "plague be spread on the walls of the house," he commands that all the stones in which the plague is shall be taken away to an unclean place beyond the city, "and he shall cause the house to be scraped within round about, and they shall pour out the dust that they scrape off without the city, into an unclean place, and they shall take other stones and put them in the place of those stones, and he shall take other mortar, and shall plaster the house." After this precaution, if it is found that the plague comes again, the priest shall again examine it, and if it is found that the plague has continued to spread, then "it is a fretting leprosy in the house—it is unclean, and he shall break down the house and the stones of it, and the timber thereof, and all the mortar of the house, and he shall carry them forth out of the city, into an unclean place. Moreover, he that goeth into the house while that it is shut up shall be unclean until the even; and he that lieth in the house shall wash his clothes, and he that eateth in the house shall wash his clothes."

We have met with instances at home in the present day of diseased dwellings of various sizes and conditions, which very nearly approach the accounts of the houses from which it was ordered according to the Sacred Writings that all the inhabitants should depart. We have noticed the efforts made to cure the "dry rot," as it is called in large structures, the removal of the diseased and introduction of fresh materials,—all this, however, without certain effect, until the house and neighbouring ground have been deeply and thoroughly drained. A few years since, as was reported at the time, although the old Church of St. Pancras had not long before been restored, the place was attacked by a rot, which rapidly destroyed the wood-work and disfigured the wall: the flooring and wood casings were covered with long mould and fungi; and the whole interior was pervaded by a deadly and offensive smell. It was in time found that the church was not fit for occupation, and on search being made for the cause, it was discovered that the surrounding ground was damp: the ground had been raised, by the interments of the dead, to a considerable height above the floor of the edifice. The drip from the roof had not been thoroughly carried away; and on opening up various parts, the vaults were found filled with water, which had drained from other graves. It is evident that, under such conditions, it was as necessary to close Old St. Pancras as it was the dwellings in the East. Effective drainage, however, did its useful and certain work; and but for that, this church must soon have become a ruin, unfit for use.

TRIFORIUM.

ON the meaning of the term *Triforium*, Mr. James Parker writes as follows in the November number of *Notes and Queries*:—

Seeing in a late number a communication on the origin of this word, reminded me that in the year 1852 I had occasion to collect notes upon the subject for a paper which I read before the Oxford Architectural Society. The derivation was evidently a mystery. One author only had used the word, namely, Gervase. He either invented it, or, as is more probable, received it from the workmen engaged on the cathedral. Ducange I found held to the theory of *tres-fores*; but unfortunately the *triforia* Gervase was describing had two or four openings. In taking a survey of all our cathedrals, three openings are the exception rather than the rule. Ducange also, as I conceive without authority, gives as the Greek equivalent τριθῦρον, a word used by Macarius, but with a very different meaning. It was the antiquary Sumner who suggested the notion of the Latinization of "thoroughfare."

First, I attempted to determine *to what* Gervase applied the name. In a careful examination of his account of Canterbury Cathedral, he evidently alludes, in the description of the fabric as it stood before the fire, to what we now call the "clerestory gallery." He speaks of "obscuræ fenestræ" above the arches, but again, above these, the "Via quæ Triforium appellata est, et fenestræ superiores." In other words, he describes a "blind story," and above is the "clerestory."

In the description of the cathedral, as rebuilt after the great fire, he says, "the architect intermingled the lower triforium from the great tower to the aforesaid pillar with many marble columns, over which he adjusted *another* triforium of other materials, and also the upper windows." In other words we have two *triforia*. What was the difference in construction between the two fabrics? I presume, judging

from other early Norman examples, that the "obscuræ fenestræ" afforded no "via," but that in the new building (the same as now standing), there was a perfect passage in the *lower* as well as the upper *triforium*. So far as to the application of the word: beyond this is conjecture.

The suggestion which I then threw out (the five years which have elapsed, I admit, have somewhat diminished my affection for it) was that the *tri* was but the scribe's contraction for *turri*, and that *forium*, as has been shown by Mr. Phillott, might well mean a passage: moreover, that Gervase particularly mentions that it was a passage, and that where there was no passage, he implies there was no *triforium*. I laid stress upon his speaking of "the triforium *from the great tower* as far as a certain pillar,"—that, in conclusion, all *triforia* lead from the different staircases to the tower, and nowhere else (or certainly all clerestory passages do, which I consider, according to Gervase, to be the triforia *par excellence*); and that in the case of central towers, with aisles and transepts, as in nearly all our cathedrals, there is no other way to the tower but along the tower-passage, or *triforium*.

I will not trouble you with the uses to which both upper and lower *triforia* have been at different times applied, as I am afraid they throw no light upon the origin of the word. At the same time I think it a subject well worthy of investigation; and perhaps, if you insert this, some of your numerous correspondents may be able to afford information as to their employment, and if any are used for practical purposes at the present day.

ST. JAMES'S-PARK: THE ORNAMENTAL WATER AND THE STEAM-ENGINE FOR PUMPING WATER.

The metropolitan public and the general public of Great Britain must be greatly obliged to Sir B. Hall for the excellent improvements made in St. James's-park, and the metropolitan parks generally. But what can have induced Sir Benjamin to place an abominable puffing, snorting, smoking, high-pressure steam-engine, on the ornamental island, at the east-end of the ornamental water? "To pump water from the new well for use in the lake," may be the reply. That fresh water is necessary all must allow, and few will find fault with any saving of money between the present cost of pumping and the former cost of purchasing water from one of the water companies, if the pumping can be carried on without noise and without smoke: the present turmoil and filth never can be sanctioned for a continuance. Fortunately, neither the noise nor the smoke are necessary. A compound engine (high-pressure and condensing) will double the power of the steam, work without noise, and save half the fuel; and coke should be used, not coal. If Government will not attend to cleanliness and comfort in such a place as St. James's-park, how can the public be asked to abate the nuisances of noise and smoke in manufacturing districts?

Civil Engineer.

WELLS CATHEDRAL.

Sir,—Seeing a letter in the *Builder*, of November 27, respecting the alterations, or rather what is almost facetiously called "the restoration" of portions of England's proudest piece of symbolism, and most exquisite work of art—Wells cathedral; and having recently spent a few weeks in that quiet city, "The drip and tinkle of whose fountain may be heard on the Mendips," I am in a position to know something of the state of the parties referred to in the said letter, and I very much fear that the protest therein is not strong enough, and will require to be repeated before it is taken notice of.

Will it be believed that the surveyor employed by the Dean and Chapter, is no architect at all? Ye shades of Britton and Pugin, arise! Ina and Giso, come forth! and once more enlighten thy supine descendants. Give ear, ye Society of Antiquaries, and hear the wail of art mal-treated by barbarous hands! Will ye stand supinely by, and see that glorious work of Joceline de Welles—the world-renowned west front, tortured by a tailor? Incredible veyor, to which was also added auctioneer. Yes, this as this must appear to your readers, such is the artist to whom the very delicate work of restoration is committed by the Dean and Chapter, to whom he is a salaried surveyor. I have myself examined the work of restoration when in progress under his supervision, and was, indeed, much grieved by the despoliation going on, arising of course from the ignorance of the architect on such matters. The masons were doing their work by contract, and were evidently making the best of their bargain. The Dean and Chapter seem to be following the very questionable wisdom of the poet,—

"Nor proudly untaught sentiments reject."

I do sincerely hope, that though Beauty sleeps in easy repose on this relic of the past,—

"In which the architect built his life,
And with him toiled his children, and their lives
Were builded with his own into the walls,"—

she must be roused by one in whom lives the awakening breath of thought and knowledge; and I also hope that the Dean and Chapter will not, in their retrenching mania, cause any more Portland cement monstrosities to take the place of stone, in the exquisite west façade, much of the restoration being done with that material. I beg, therefore, to suggest (through your columns), that the Society of Antiquaries (of which I am a member), bestir themselves, and address a memorial to the Dean and Chapter on this very important subject.

F. S. A.

Knowsley-park.

BRICKS, ANCIENT AND MODERN.

The art and practice of brick-making are, no doubt, as old as civilization. A full history, with diagrams of the several forms and dimensions, would have special interest,—will no one take up the subject? Egypt, Assyria, India, Persia, China, and Europe will furnish splendid examples of bricks and brickwork. There may also be something gleaned from Mexico and from Peru. There have been solid bricks, and even hollow bricks, from a remote period. The Romans carried brickmaking to great perfection, and probably first introduced the art into Great Britain, as also on the Continent generally. They made hollow bricks on block moulds, and used them for hot-air for rooms and baths. There are samples in the Museum at Rouen, and at Newcastle-upon-Tyne. There are also radiated (that is arch) bricks, of the Roman period, at Newcastle.

Roman Bricks at Newcastle.

$6\frac{1}{2}$ in. × $3\frac{1}{4}$ in. × $1\frac{3}{8}$ in. } Red brick clay, very rough,
8 in. × 4 in. × $1\frac{1}{2}$ in. } and bent in digging.

Roman Arch Bricks.

7 in. × 6 in. × 2 and $1\frac{1}{4}$ in.
$7\frac{3}{8}$ in. × 8 in. × $1\frac{1}{2}$ in.
$10\frac{1}{4}$ in. × $10\frac{1}{4}$ in. × $1\frac{1}{2}$ in.

11 in. × 7 in. × $6\frac{1}{2}$ in. hollow brick, $\frac{3}{4}$ in. thick, so that the space is $5\frac{1}{2}$ in. × 4 in. This hollow brick has been used for a bath flue.

The following dimensions and prices may be useful just now, as there will probably be work for Englishmen in the East soon.

Prices of Tiles and Bricks at Constantinople, 1855.

Bricks, 12 in. × 6 in. × $2\frac{1}{4}$ in. at 600 piasters per 1,000 = about	£5	0	0

These tiles are light coloured, and are used for floors.

Best Quality.

10 in. × 5 in. × $1\frac{1}{4}$ in. at 350 piastres per 1,000 =	£2	18	4
9 in. × $4\frac{1}{2}$ in. × $1\frac{1}{4}$ in. at 370 piastres per 1,000 =	3	1	8
$9\frac{1}{2}$ in. × 5 in. × $1\frac{1}{2}$ in. at 350 piastres per 1,000 =	2	18	4

Common Quality.

15 in. × 15 in. × $1\frac{3}{4}$ in. at 320 piastres per 1,000 =	2	13	4
10 in. × 10 in. × $1\frac{1}{2}$ in. at 200 piastres per 1,000 =	1	13	4

Tubular Pipes, hand made.

Common red earthenware, poor in quality.

3 inches diameter, at $1\frac{1}{2}$ piastre each	3d.
6 inches diameter, at 2 piastres each	4d.
9 inches diameter, at 4 piastres each	8d.
13 inches diameter, at 8 piastres each	16d.
15 inches diameter, at 10 piastres each	20d.

The pipes are each 12 inches in length, and are made with spiggot and faucet ends.

Bend-pipes or curves are not made, but all junctions are with sharp elbows. The prices are as under:—

3 inches diameter, at 2 piastres each	4d.
6 and 9 inches diameter, at 4 piastres each	8d.
13 and 15 inches diameter, at 9 piastres each	18d.

N.B. The piastre is taken as of 2d. value, English money. The rate of exchange, however, varies.

TRADE PRICE-LISTS.

The current number of the *Builder* is not the first in which it has been suggested that trade price-lists, and circulars relating to building matters, should be issued of a uniform size. Might not the idea assume a more practical shape if the Architectural Exhibition committee required exhibitors in the "Materials Department," in the forthcoming exhibition, to comply with a rule framed for the purpose?

Small quarto, say 10 inches by 8 inches, leaving a margin of $1\frac{1}{2}$ inch to the left of the paper for binding, if desired, would be a convenient form.

E. B.

THE WORD "*GAS*."

Sir,—I am glad that your correspondent, "J. B." (in a late No. of the *Builder*), has publicly put the question with respect to the spelling of the plural of the word commonly written *gas*, because it affords me the opportunity of pointing out what I consider the anomalous heterography of this word.

If there is one rule with respect to English orthography which is clearer than another, and which admits not of exception, it is that all nouns substantive ending with the sound of *s*, *preceded by a short accented vowel*, double the final letter. Such words are, *lass*, *class*, *glass*, *grass*, *stress*, *dress*, *redress*, *excess*, *mass*, and hundreds of others. Indeed, there is scarcely an exception to this rule in the whole English vocabulary.

The only reason I can conceive for deviating from the general rule in this instance is, that probably we derived the word from the German chemists; and it being regarded, on its introduction, as a foreign word, was consequently spelt as in the original. But as it has now become completely naturalised, it certainly ought to be made to follow the analogy of our own language, in conformity with other words derived from the same source; for the words *grass* and *glass* are both spelt in German with one *s*; and precisely for the same reason they spell *gas* with one; and for the opposite reason we ought to spell it with two; namely, they pronounce the preceding *a long*, while we pronounce it with a *short* quantity.

I hope that it is not yet too late to see this alteration universally adopted, especially if it should have the sanction of the *Builder* and other influential journals. The public eye would soon get accustomed to the alteration, and one anomaly, at least, would be erased from the long list which at present disfigures our language, and thus would "J. B.'s" question be practically and consistently answered.

B. J.

RECENT PATENTS.*

Thomas Robert Winder, Dover.—*Constructing Submarine Works.* Dated April 11, 1857.—This invention relates to a mode of simplifying the construction and the placing of large blocks of concrete or masonry to form the foundation or underwork of piers, harbours, and other like submarine structures. To attain this end the patentee forms a floating caisson of plates of cast or wrought iron bolted or riveted together, and this floating vessel (which is open at the upper part) he brings over the spot which is intended to receive a large block of concrete or masonry. Having moored or otherwise secured this floating vessel in the required place, he discharges concrete therein, or he builds up brick or stone work therein as required, and by the accumulation of such building materials in the vessel, the latter is sunk to a given depth in the water. He next builds up the sides of the vessel by adding plates of iron to the upper part of the vessel, and thereby increases the capacity and depth, the upper edge of the vessel being raised considerably above the surface of the water. When this is effected, he continues to throw in concrete or build up masonry within the vessel, repeating the building up of the outer iron casing as the vessel sinks by the accumulating weight placed in it. In this way the caisson or vessel is charged with masonry or concrete until it sinks to the bottom, where it will by its own weight remain fixed and immovable, and form a secure artificial foundation for any subsequent superstructure; or the superstructure may be formed by continuing the building up of the vessel or caisson.

James Bird Sparke, and Alfred Sparke, Thornlane Foundry, Norwich.—*Sawing Machinery.* Dated April 8, 1857.—The first part of this invention relates to that part of sawing machinery which is employed to give motion to the timber under operation, for the purpose of bringing it up to, and keeping in contact with, the saw during the cutting, and of withdrawing it from the saw when the cut is completed. The second part of the invention relates to the mode of driving reciprocating saws, or saws which act upon the material to be cut by successive strokes.

George White, Laurence Pountney-lane, Cannon-street, London.—*Glass Furnaces.* A communication. Dated March 26th, 1857.—This invention consists in heating glass-houses, or furnaces for the manufacture of glass, by means of the complete combustion of the gasses derived from wood, coal, peat, lignite, anthracite, or any other suitable fuel, the full combustion of the said gasses taking place by means of a blast of hot air, the injection being thus regulated that the full combustion of the gasses, and consequently the highest temperature, takes place in the central part of the furnace towards the melting-pots. This system of heating is applicable to glass-furnaces of any size, the fire-grates being entirely done away; thus offering an additional space for the melting-pots.

* Selected from the lists published in the *Engineer*.

BENJAMIN HORATIO PAUL, Torrington-street, Torrington-square, London.—*Preservation of Stone, either natural or artificial, also of Cements and other similar compositions.* Dated April 1, 1857.—This invention is effected by applying to the stone, &c. solutions of the aluminates of soda, potash, or of other aluminates, also of the zincates of soda or potash, or phosphates of alumina, or zinc in solution by alkalis; also similar preparations of lead or molybdenum. These solutions are employed either alone or (for the purpose of more effectually filling the interstices or pores at the surface of the stone, &c.) mixed with finely-powdered substances, which are little liable to be affected by the atmospheric influences existing in towns. The substances to be used for this purpose are silica, carbonate of magnesia, baryta or zinc, sulphate of baryta, French chalk, or other similar substances. The material thus introduced into the pores may be coloured by the addition of oxide of iron, plumbago, or other suitable pigment.

CHARLES PASCALL, Norwood, Surrey.—*Tile-making Machinery.* Dated April 29, 1857.—This invention relates to the shaping of the ends of tiles, and cutting them off, when produced in lengths, from the squeezing-box or other expressing or forming apparatus forcing the plastic material through a die. The expressing and forming the tile material in lengths is the same as usual. The length of the tile material when expressed or formed is received in rollers, or otherwise supported while being cut off in proper lengths, and at the same time having the ends of the tile shaped. The patentee effects this by means of two wires, suitably stretched between two slides, which traverse across the breadth of the tile in guides, which cause the wires to traverse in curves or lines, so as to describe and cut the tile of the proper length, and with the ends of the form required.

TERTIUS JOHN COOKE, Wolverhampton.—*Manufacture of Knobs, Roses, and Escutcheons, used for doors, drawers, shutters, and other similar purposes.* Dated May 2, 1857.—The knobs are made partly of brass and partly of sheet iron, or partly of cast iron and partly of sheet brass, or partly of cast or malleable iron and the remainder of sheet iron, and the roses and escutcheons solely of sheet iron. The invention also comprises improvements in ornamenting the same, and also in ornamenting the ordinary description of articles of the same kind which are made of cast or sheet brass, or both combined, by japanning, enamelling, painting, or inlaying them.

JOHN LESLIE, Conduit-street, Hanover-square.—*Apparatus for Ventilating Buildings.* Dated May 4, 1857.—In carrying out this invention, an air-shaft is fixed to the ceiling or upper part of a building, in such manner as to rise through the roof, and on the exterior of the air-shaft is formed an enclosed chamber, open at bottom and closed at top, by which combination of parts the heated atmosphere of the building will enter the enclosed chamber around the air-shaft and keep it warm, and will thus induce a rising current through the air-shaft.

RECENT AMERICAN PATENTS.*

JOSIAH BROWN, Jun. Buffalo, New York.—*Improvement in Truss Bridges.*—Claim: Providing each of the main and counter braces with two gains at top and bottom, and each of the timbers of the chord with a gain at a point where the braces are applied corresponding with the gains in the braces, and passing the braces thus formed up between the timbers with the gains of the braces in such relation to the gains of the timbers, that when the timbers of the chords are brought together they are combined, and become, as it were, only one piece, no part of which can be operated upon or affected independently of the other, by the downward and upward thrusts common to truss bridges, even if the bolt which passes laterally through and intersects each set of braces and the timbers of the chord were removed.

GEORGE S. AVERY, Lewisboro', New York.—*An Improvement in Segmental Truss for Bridges, &c.*—Claim: An improvement in segmental truss bridges, by a combination of the arched top chord, horizontal bottom chord, braces, vertical tie-rods, packing blocks, and self-adjusting shoes, the whole constructed into a segmental truss of greater strength and stability than such as are generally used with the same amount of building material. Also, the combined arrangement of the different parts.

FRANCIS C. LOWTHROP, Trenton, New Jersey.—*An Improvement in Iron Truss Frames for Bridges.*—Claim: The straining plate, in combination with the rods, when the latter are connected to the plate, and when the said plate is arranged to receive the vertical or verticals and diagonals of iron truss frame bridges."

LEMUEL P. JENKS, Assignor to GEORGE A. GARDINER, Boston, Massachusetts; ante-dated Jan. 7, 1857.—*Improvement in Rock Drilling Machines.*—Claim: The use and application of the india-rubber, when interposed in such manner that its expansive force shall operate the drill in rock drilling machines.

GEORGE A. GARDNER, City of New York, Assignor to self and LEMUEL P. JENKS, Boston, Mass.—*An Improvement in Rock Drilling Machines.*—Claim: The peculiar combination and arrangement of the devices, whereby the rotation of the mandril and drill, as well as the gradual and proper advancement of both drill, mandril, and frame, or either of them, is effected by means of a single eccentric on the cam shaft.

WILLIAM VAN ANDEN, Poughkeepsie, New York.—*An Improved File-cutting Machine.*—Claim: The arrangement of a bed on which the file blank is cut, having a forward positive feed motion, and an independent forward motion against the edge of the chisel, in consequence of the percussion of the hammer, and the difference of the resistance of the metal at the back edge of the chisel, wedging it forward at the time of cutting the teeth of the file to cause their upsetting. Also, the combination and arrangement of the bed on which the file blank is cut, with the triangular feed-gate and side rails of the machine frame. Also, the combination and arrangement of the ratchet-wheel spring, and detent pins, or their equivalents, in combination with the pawls for operating the same. Also, the use of the compound self-adjusting chisel-holder stock, in combination with the chisel, whereby it is held rigidly in its place under the blow of the hammer. Also, the use of the triangular gate as a feed motion to my compound bed, in combination with the apparatus for operating the same.

HEZEKIAH B. SMITH, Lowell, Mass.—*An Improved Mortising Machine.*—Claim: 1st. The adjustable compound treadle, when used in combination with a mortising machine. 2nd. The pawl, or its equivalent, in combination with the table, to prevent the action of the chisel from jarring the foot, not intending by this to confine myself to the exact form represented, but adopting any other substantially the same.

HENRY F. WILSON, Assignor to self and HENRY B. WEST, Elyria, Ohio.—*For an Improved Cross-cut Sawing Apparatus.*—Claim: The radius bars, in combination with the vibrating bars, for the purpose of straining the saw so as to enable me to give the saw a reciprocating motion without guides. Also, placing pins at a greater or less distance apart than pins for the purpose of giving a rocking motion to the saw while reciprocating, said motion to be graduated according to the kind of wood to be sawed.

THOMAS D. WORRALL, Lowell, Mass.—*For an Improved Joiners' Plane.*—Claim: 1. The employment of the clamp lever for securing and bedding the bit. 2. The clamp lever, as arranged in combination with T strap and nut, for the purpose of regulating and adjusting the bit for cutting, when firmly bedded and secured.

GILBERT BISHOP, City of New York.—*For an Improved Rotary Veneer Machine.*—This invention consists in cutting veneers and other thin stuff by a knife, with a circular or curved edge in rotation in the line of its edge, while the log from which the veneer is to be cut is vibrated or turned towards the knife edge as it passes, so that the knife progressively covers the whole top surface of the log, and cuts the veneer by a continuous rotary drawing, thrusting and varying stroke of the edge from point to heel, as the log is presented to and brought in contact with it.

JOSEPH H. GOODELL, Bridgeport, Connecticut.—*For an Improved Machine for Straightening Veneers.* Claim: The reduction or removal of the curve or scroll shape given the veneer in its cut from the log or stick, by the introduction and feed of it endwise, that is, transversely to the general direction of the curve assumed by it in the cut between a roller or rollers, and carrying and pressing apron, arranged for operation together and on the veneer. Also, in combination with the several rollers and endless carrying and pressing apron, when the same are relatively arranged, the adjustable frame to the one roller, to give increased or diminished pressure to the apron against the back of the pressing roller, or interposed veneer.

GEORGE W. BISHOP, Brooklyn, New York.—*For an Improvement in Iron Pavements for Streets.*—The object of this invention is to make a pavement for streets of blocks of iron, so formed on their upper surface as to effectually prevent horses from slipping, and permit water with accumulating dirt to run off to the side gutters, and, at the same time, of securing rails thereto for a railroad. Claim: Making cast-iron paving blocks with a series of transverse draining grooves, which, when completed and laid, will form grooves running from the middle of the street towards the side gutters or sewers. Also, forming the surface of iron paving blocks with a series of inclined planes and shoulders, to prevent horses from slipping, while, at the same time, carriages will roll over the surface without serious impediment or concussions. Also, the said series of inclined planes and shoulders, in combination with the lateral grooves for draining, but which also answers the purpose of preventing horses from slipping. Also, the manner of uniting the iron blocks in laying a pavement by the alternating over and under lapping of the series of blocks, whereby the blocks are enabled to sustain one another, and thereby more effectually maintain the required grade.

* Selected from the lists published in the *Journal of the Franklin Institute*, of Pennsylvania.

Books Received.

Many Thoughts on Many Things;—being a Treasury of Reference, consisting of Selections from the Writings of the Known Great and Great Unknown. Compiled and analytically arranged by HENRY SOUTHGATE. London: George Routledge and Co. 1858.

THIS really is what it purports to be, a Treasury of Reference, and will be found worth its weight in gold by literary men, and those who want materials for thought. As Mr. Southgate justly says, too, it "is not only adapted for occasional reference to any particular subject, but, from the variety of interesting topics, both in prose and verse, which it comprises, it may also afford many an hour of agreeable and instructive reading. We are here conducted, as it were, through a picture-gallery of the first masters,—through a garden of the choicest flowers,—where the social virtues may be promoted, the pleasures of refined intellectuality cultivated, and some of the purest delights of which the human heart is susceptible freely enjoyed."

Classification and analysis have been closely observed to give facility for reference to any general subject, and this the searcher will find illustrated in its various phases by, for the most part, distinguished writers. Here and there an anonymous quotation occurs, which might have been omitted without damage to the book; but of this, the little too much, one ought scarcely to complain. It is one of those books in which there is always something to discover. The extent of the collection says much for Mr. Southgate's reading and industry; and the arrangement of it speaks for his taste and acuteness. The dedication to "His Friend and Partner, Joseph Barrett," will serve to remind readers that they have heard of Mr. Southgate before in another capacity,—engaged in "knocking down," rather than building up, books.

What he has now put together is a massive volume of nearly 700 pages, of which the index alone occupies thirty-four. The book is beautifully printed, and does great credit to Messrs. Cox and Wyman, at whose establishment it has been produced. The type is good, and the arrangement of the pages elegant.

Rudimentary Treatise on the Marine Engine, and on Steam-vessels and the Screw. By ROBERT MURRAY, C.E. Third Edition. London: Weale, High Holborn. 1858.

THIS very excellent treatise by the Engineer Surveyor to the Board of Trade has been revised and considerably altered and improved since its last edition was issued. The practical remarks on the screw and propelling power as used in the royal and merchant navy are especially interesting. Much new and useful information is also compressed into tabular and other forms in the Appendix, and the volume is illustrated by various engravings. We cordially recommend it.

"Divide et impera:"—Statistical Book-keeping; being a Simplification and Abbreviation of the common System by Double Entry; together with Suggestions for the Prevention of Defalcations and Frauds in Banks, &c. By F. C. KREPP. London: Longman and Co. 1858.

THIS is certainly, to all appearance, a very elaborate work on "Statistical" book-keeping; but it must be for regular business-men,—tradesmen, manufacturers, and others,—by affording it a fair trial, or, at least, that consideration which it seems to deserve, to say whether it be sufficiently practical to induce them to discard the system on which they have heretofore gone. The new system, however, does not appear to be so much an antagonistical scheme to that of book-keeping by double entry as a centralisation of that system itself, an abstract and index superadded to it, and over-riding it, as it were; or a master-key to its more detailed and disconnected contents. By means of what has the aspect, at first sight, of a somewhat formidable complication of the ordinary system, we have thus, in effect, a simplification arising out of the re-arrangement. It is for practical book-keepers to test the merits of Mr. Krepp's statistical system, and we commend it to their notice as involving the addition of a promising novelty to the established system, which it may be also said to comprise within the comprehensive sphere of its operations. It is said to be the result of fifteen years' personal observation and practical experience, in English, American, and German counting-houses, and we can well believe it to be so.

The book of statistics, or centralized epitome of the business, appears to bring the whole of its transactions within a comparatively small compass, and to be "ultimately made to contain the very essence of a large pile of other books, kept during a period say of ten years, or longer, if required." By keeping out of sight all distracting details of secondary importance, a sort of bird's-eye view of the whole range and drift of affairs, however extensive and complicated, is thus professed to be obtainable.

The author's suggestions with reference to the prevention of defalcations and frauds in banking and other companies also seem to merit attention.

Miscellanea.

From Brompton to Bayswater, *vid* Park-lane.—The necessity of skirting round all Hyde-park to reach Bayswater and other districts north of the Park from Brompton, Knightsbridge, Chelsea, &c. to the south of it, and *vice versâ*, either on foot by night, or by vehicle at all times, is a great grievance of which we have often complained. The crossing of Hyde-park by a public road, open at all times, has been urged; but interference with the privacy and the integrity of the park formed one main difficulty in the way of such an arrangement. To obviate this difficulty it has been proposed to sink the public road below the level of the park, and this might be done, probably, whatever route were proposed to be taken. A matured plan has been laid before us by Mr. Risdon, of Bayswater, who proposes to open such a road along by the sunk wall of Kensington-gardens, from near Victoria-gate, and opposite Westbourne-street, to the present bridge across the Serpentine, close beside which it would pass by an additional bridge, whence it would run to the Kensington-road, a little to the east of Gore House, and opposite the new road leading to "South Kensington" and the Art-Museum. Some such line of road is just what is wanted to obviate the very great nuisance referred to.

Slip at Cardiff.—About three weeks since, notice was given that after a certain date no more vessels would be allowed to enter the East Bute Dock, as the contractors intended clearing away the embankment between that portion already in use and the extension just completed. For this purpose the water was turned out of the dock, and the inner gates of the lock were taken up, not being considered sufficiently strong to bear the pressure of water upon them, and another pair was ready to be laid down. The contractors, Messrs. Hemmingways and Pearson, put on a large number of hands in removing the bank, and it was thought that the work would have been completed in about a month to the satisfaction of all parties. We regret, however, to state that about one o'clock on Tuesday (the water being out) a large portion of the eastern wall gave way, carrying with it the foundation, the tramway, and a quantity of iron ore, which was alongside. The wall for at least sixty or seventy yards is completely gone, the angle where the slip occurred projecting some ten or fifteen feet beyond the level, the stones being separated from each other, and some of the large blocks of forest stone, about three feet thick, being completely smashed—some of them into a thousand pieces. We are told, however, that no fault can be laid to the contractors, but that the heavy weight on the banks, and the support suddenly withdrawn by letting out the water, have been the sole cause. The damage is estimated at between 11,000*l.* and 15,000*l.*, but it is feared that, if another slip should occur, the whole of one side will have to be rebuilt.

Cambridge Architectural Society.—At the last meeting of this society, the report of the committee was read, which said, amongst other things:—

"It is gratifying to observe the gradual prevalence of an improved taste in the matter of domestic architecture. We allude especially to the new brick house in Trumpington-street, and to those near St. Michael's church, which were the first built after a more picturesque design. We believe that much of this improvement is due to the taste of Mr. R. R. Rowe, the town surveyor.

We now proceed to notice some important works in the county. At Ely, the princely munificence of the dean and chapter has borne fruit in results which bid fair to render their cathedral pre-eminent in interest and beauty. The east window has been filled with stained glass by Mr. Wailes, which for brilliancy and clever contrasts of colour approaches the best French glass of the thirteenth century. We are glad to say that of the late bishop's bequest, enough money yet remains to enable the chapter to place several new windows in the choir: a work which will shortly be commenced. The reredos has been finished, with the exception of the figure of Christ on the central pinnacle, and is now being gilt and coloured: stone screens have been placed behind the stalls, which are themselves, together with the rood screen, shortly to have their panels and their niches filled with the sculptures which have so long been wanting to complete them; the north transept will soon glow with colour, and be further enriched with stained-glass windows and frescoes: nor is this all—it is proposed to board in the roof of the nave, and to execute thereon, under the direction of Mr. L'Estrange, a fresco similar in design to that of the church of St. Mary Magdalene, at Hildesheim, in the kingdom of Hanover, which is now undergoing restoration."

The Smedley Viaduct.—Signs of instability have shown themselves in this structure, according to the *Manchester Courier*. At the last meeting of the city council a report was presented, which stated that the extra cost for strengthening the viaduct, in consequence of previous failures of bad work, would be 1,480*l.* A larger sum than this, adds our authority, will in all probability be sunk upon the work before it is pronounced safe, and it may possibly have to come down bodily. It is built of brick, and the chief cause which led to the failure of some of the arches is said to have been the imperfect manner in which a portion of the contract had been fulfilled. Additional work to strengthen the principal abutments was added, and the bridge seemed likely to stand in security. These further cracks, however, caused grave doubts to be entertained whether the viaduct will last long.

Damages for Injury by a Scaffold.—At the Manchester County Court, last week, judgment was given in a case of some interest. The action was brought to recover damages for a serious injury caused to the plaintiff's wife, by the falling of a boarding in front of three houses in Oldham-road, Manchester, belonging to a Mr. Gregory, a watchmaker, one of the defendants. The judge was of opinion that the scaffold ought to have been of sufficient strength to have withstood the effects of wind. It appeared that it was Edwards, one of the defendants, who applied at the Town-hall for permission to put up the boarding, but he did not erect it himself. The owner of the property let off the work to various persons—an excavator, a bricklayer, and a carpenter. It did not appear to have been the business of anyone in particular to put up the boarding securely; but it was a fact that Mr. Gregory was the owner of the property, and he paid the joiner by whom the boarding was erected as his servant. This he (the judge) thought was evidence sufficient to make Mr. Gregory liable, and the verdict must, therefore, be against him for 40*l.*

The Agricultural Implement Trade. — A paper was read on the 9th inst. at the Society of Arts, by Mr. S. Sidney, "on the progress of the agricultural implement trade during the last twenty years." The paper, with a discussion which followed, is published in the *Journal* of the Society, of the 11th inst. Mr. Sidney, in the outset, stated that his object was not to instruct agriculturists, but simply to give that large class who got their meat from the butchers, and their bread from the bakers, without troubling themselves about the origin of either commodity, some idea of the vast amount of mechanical ingenuity and agricultural experience, which has been devoted during the last twenty years, to making inferior soils fertile, and fertile soils more productive, to economising time and labour in every operation of husbandry, so as to keep pace, as far as soil and climate would allow, with the daily increasing demands of our town population. After the discussion, in which several agriculturists and other gentlemen took part, Mr. Sidney, in conclusion, maintained that the time had come for reserving prizes for great and much-needed inventions or improvements, such as steam ploughing.

Public Decorations.—We are told that great preparations are being made for the approaching marriage of the Princess Royal, and that the Chapel Royal is to be re-decorated for the occasion. In glancing the other day at records of some of the state marriages of former days, we were struck, if we may say so, by the ugliness of the decorations. On the marriage of George II. the interior of the sacred edifice was fitted with large crowns, stuck over with wax candles and chandeliers of the most questionable shape. We hope, however, that matters will be managed in a more artistic manner. Royal marriages during the Middle Ages, celebrated in our fine old cathedrals, were splendid affairs, and the city was made gay with tapestry and other rich hangings. We have discussed a good deal of this ancient magnificence. The elegance of the fittings of the Chapel Royal and other localities should be worthy of the age.

The Architectural Society's Illustrations.—Sir: May I beg to be allowed to make a few remarks in reference to a review of the Architectural Publication Society's last part, in the *Builder* of the 5th inst. Did the plates, as issued to the members, represent my work as it was drawn upon the stone, your critique would be perfectly just; but so far from such being the case, the drawings have, in the preparation of the stones, or from some accident in the printing, suffered to such an extent as quite to ruin them. My work has hitherto given satisfaction to the Society, and some members of the committee, who saw these on the stone before they were proved, expressed themselves pleased with them. Valuing my reputation as an artist, which would suffer severely were so unfavourable a review of my work deserved, I venture to trouble your columns with this explanation; and, thanking you for your approval of my work in general, I am, Sir, &c.

Francis Bedford.

Laying Submarine Cables.—Messrs. C. and G. Johnson, of Wandsworth, have described to us the model of an apparatus specially designed for laying down wires for submarine telegraphs, now in their hands. They say within a frame about 14 feet long, 8 feet high, and 3 feet wide, are arranged three distinct break-wheels, representing three points of a triangle. Each wheel is provided with a lever and roller, so placed as to act on a point in the circumference, and exert a power opposed to the motion of the wheel, by which its revolutions may be retarded or regulated with precision. The end of a cable once passed through this machine, is taken firm hold of by a peculiarity in the construction of the break-wheels, and may either be hauled in or paid out without a single coil. It is self-acting, the strain imparted being correctly indicated, and can never exceed the prescribed bounds. In laying down a cable in deep water, the quicker the operation is performed the better, as then the wires would not have time to drift away, and consequently unnecessary slack will be prevented. They say their machine could be made to work perfectly well, going 15 knots an hour, or more if required.

"Art in Architecture."—Sir: My good friend "Commonsensius" is desirous, through the medium of your columns, to propose for the consideration of "Aristides" a few remarks upon the opinions he has expressed on the subject of "Good Taste in Architecture." He would speak to "Aristides" as follows:—"You say that, 'irrespective of any question as to style, *that* design *must* be in good taste which, whether viewed in mass or in detail, produces a pleasing, harmonious *ensemble*.' Now, sir, you must permit me, with all deference, to remark, that your definition is a complete failure. It is true, *as far as it goes*, but it does not get to the root of the matter. Both 'Donaldo' and 'Rufskinius' would readily give their assent to the truth of this proposition, because they could do so without thereby making any admission adverse to the cause they have in hand, without resigning that undivided sovereignty they have so ably claimed for the style of their adoption. The question is not 'whether or no that style is in good taste which produces a pleasing, harmonious *ensemble*,' for the affirmative of that proposition is admitted by all, without one dissentient voice. The real point at issue is, 'Whether such and such a design does, or does *not*, produce an effect that all men ought to call pleasing.' And this is where your definition fails; for combinations of form before which 'Rufskinius' would stand entranced—oblivious of the toils and troubles of this work-day world—wrapped in ecstatic contemplation, and soaring on the wings of harmony to the seventh heaven of delight; these combinations would, in the mind of 'Donaldo,' produce no other emotion but that of unmitigated disgust. Where 'Rufskinius' found nought but

'Music that gentler on the spirit lies
Than tired eyelids upon tired eyes,'

he would only be conscious of a horrible discord, enough to set his very teeth on edge. Still, I should think, sir, as far as I can gather from the general tenor of your argument, that your opinions are in the main perfectly just and orthodox; and I would, therefore, entreat you to bring your powerful mind to bear once again on the question at issue, and I feel sure you would then be able to furnish us with a definition that may be of real service to us." If, Mr. Editor, you should think it worth while to give insertion to this "mild remonstrance," you would oblige.—R. M.

The Soulages Collection.—Lord Granville, the Lord President of the Committee of Council on Education, received a deputation from the Royal Institute of British Architects, with reference to the purchase by Government of the Soulages Collection, on Wednesday afternoon, at the Privy Council Office.

The Diseases of Trades: Bakers.—On reading Dr. Letheby's annual report and statistics upon disease and death, I find from his investigations all classes have their peculiar diseases, phthisis being the malady of bakers; and the *Times* observes,—"But surely the fact that particular complaints can be so easily apportioned among particular trades justifies the hope that, with ordinary care, their prevalence can be very much diminished." After reading Dr. Letheby's report, I calculated how many journeymen bakers have died, who had worked for me, within the last ten years: the result was to me saddening. My men have generally lived with me some years, but I can count fifteen young men (none forty years of age) who have fallen victims to this bakers' malady, in one form or other of the disease. Now, sir, I know that if bakers would do away with the present unhealthy, dirty, and barbarous manner of kneading bread, our trade, for one, would soon show a more encouraging account in the future reports of the City's chief medical officer. I sincerely thank you for the encouragement you have given me in favourably reviewing my endeavours to promote the sale of pure bread in this metropolis.

C. Stevens.